

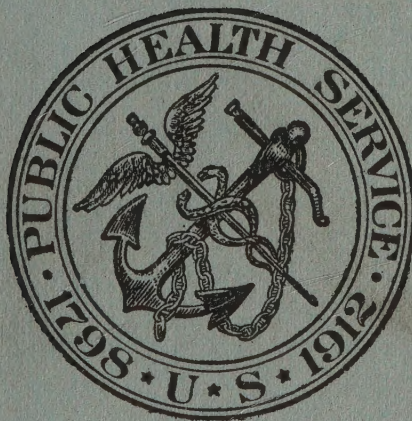
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PUBLIC HEALTH BULLETIN

No. 164

**MUNICIPAL
HEALTH DEPARTMENT PRACTICE
FOR THE YEAR 1923**

BASED UPON

**SURVEYS OF THE 100 LARGEST CITIES
IN THE UNITED STATES**



**TREASURY DEPARTMENT
UNITED STATES PUBLIC HEALTH SERVICE**

WASHINGTON, D. C.

1926

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JULY, 1926

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BASED UPON
SURVEYS OF THE 100 LARGEST CITIES
IN THE UNITED STATES

MADE BY THE
UNITED STATES PUBLIC HEALTH SERVICE
IN COOPERATION WITH THE
COMMITTEE ON ADMINISTRATIVE PRACTICE
AMERICAN PUBLIC HEALTH ASSOCIATION



WASHINGTON
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1926

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INTRODUCTION

This report constitutes a study of the health service provided in the group of 100 large cities of the United States, each having a population of 70,000 or over according to the census enumeration of 1920. The entire group had an estimated mid-year population of 32,155,096 in 1923, the year for which the data were collected.

The present study is based upon the information and data collected by means of field surveys, conducted by approximately 50 medical officers and sanitary engineers of the Public Health Service, selected because of their location or previous experience in survey investigations.

After several months' careful revision, a common schedule was prepared and used as the basis of the surveys in order to secure as great uniformity as possible in the collection and presentation of a report covering the health service of each city. Because of the great variety of organizations and practices characterizing the health services existing in different cities, there are obvious difficulties in attempting to present a review of these activities in any group of cities or to collect the required information in any orderly sequence that permits of satisfactory analysis or comparative study. Notwithstanding the shortcomings of any schedule intended to present the entire picture of municipal health service, it still remains the only feasible method of conducting such surveys, especially when the data are to be collected by a number of independent investigators.

The field studies were begun in February, 1924, and were practically all completed by July 1 of that year. The records for a few cities were completed later in order to convenience the local officials and avoid unnecessary interruptions to their routine activities. Individual surveys required on an average about 10 days although this varied according to local conditions and the size of the city.

With but few exceptions, the information and data that form the basis of this report represent the calendar year 1923. This fiscal year or the annual period usually taken as the basis of reporting by different cities varies, but as far as possible, and for all practical purposes of comparisons, the data analyzed or presented will represent conditions covered by the calendar year 1923. There have been a few changes since this time in a few of the cities, included in this report, but as a whole, the picture of health services presented will represent average practice at the present time.

The survey of 100 large cities in 1924 was primarily intended to repeat a somewhat similar survey undertaken by the committee on administrative health department practice, appointed by the American Public Health Association in 1920. In 1921 this committee completed the survey of 83 large cities, each having a population of approximately 100,000 or over in 1920. The United States Public Health Service cooperated in this survey by detailing service officers who covered 25 cities, and by publishing the final committee report.¹

The objectives of this committee, as set forth in minutes of their meetings, included the collection of information in regard to public health practice, with a critical analysis of the data so collected and an attempt to devise means of bringing objective standards of practice to the attention of individual health officers.

Following the survey of 1921, the committee concluded that definite machinery should be provided for continuing the collection of current information and data in respect to municipal health practice, and it was proposed that the United States Public Health Service was the logical agency to conduct these general basic surveys, the information so collected to be made available to all recognized agencies interested or engaged in public health work. The committee's recommendation to this effect was approved by the Surgeon General and the office of administrative health practice was established as previously mentioned.

It was thought that resurveys of the same group of cities would serve to point out the progress made since 1920 and it was suggested by the committee that similar general surveys should be made from time to time in order to maintain current records of the practice in these cities.

While it is true that individual cities will show certain changes in their organization, methods and procedures from year to year, it now seems doubtful if the time and expense necessary for comprehensive field surveys of entire health services in large groups of cities is justifiable. In general, the information and data already at hand are sufficient to establish the essential principles of present-day practice. Individual cities will deviate from the average practice and local problems will continue to require local adjustments.

Fairly satisfactory current records for the 100 large cities now under consideration can undoubtedly be obtained by correspondence and an occasional personal visit when indicated.

It would seem that more substantial progress in promoting public-health administration will result from a critical analysis of present methods and by interpreting the facts already accumulated. Therefore, instead of undertaking elaborate field surveys of the whole

¹ Report of the committee on municipal health department practice of the American Public Health Association. Public Health Bulletin No. 136. July, 1923.

structure and practices of the health service in large groups of cities, the chief objective of the office of administrative health practice for the present consists in developing its available resources to promote studies of special activities and the details of present practice in the endeavor to establish fundamental and essential principles; and to determine, if possible, the more profitable methods and procedures and to encourage the weeding out of those found to be worthless or unprofitable.

The present report on the 100 large cities consists of a series of monographs prepared for the most part by authors who have been closely associated with special activities or who have become recognized as authorities in their respective fields of work. In the selection of these authors the committee on municipal health department practice (now known as the committee on administrative practice) offered its services, and four of its members prepared the chapters on public-health administration, vital statistics, communicable-disease control, and hospitals and relief. Through member organizations of the National Health Council, authors were proposed and chosen for the chapters on tuberculosis, venereal diseases, and mental hygiene. School medical inspection, food control, and general sanitation were written by administrative health officials, and infant welfare was prepared by a member of the staff of a university school of public health; officers of the Public Health Service contributed the chapters on education and publicity, industrial hygiene, public health nursing, milk control, water supplies, and excreta disposal.

In order to supply the committee on municipal health department practice with the information required for its use in developing an appraisal form for city health work, photostat copies of the schedule reports for each city were made at the committee's expense, and copies of the sections pertaining to each activity covered by this report were furnished to the respective authors. Copies of individual surveys have also been prepared for local health officers in several instances.

Special tabulations of data have been made in response to requests received from various sources. The records are available at all times to health officials and responsible agencies who are interested or engaged in public-health activities.

The analysis of the information and data collected by the survey of 1924 and the opinions expressed in the several chapters represent entirely the interpretations and conclusions of the authors themselves, who, because of their experience or training, have undoubtedly become qualified to express critical opinions and reliable conclusions in their interpretation of the data under consideration. Consequently no attempt is made to vouch for the validity of their conclusions or to criticize their opinions. In presenting each prin-

cial activity in this report, the editing office has not assumed any responsibility for the manner of presentation or the decisions and opinions expressed by the authors.

The complete report was assembled in the office of administrative health practice, edited for typographical errors and uniformity, basic data checked as far as practicable, and otherwise prepared for final printing. It was believed that such a report would become more valuable if each important activity was treated by a competent authority instead of attempting to present the entire report as a product of a single individual.

In addition to the analysis of the material collected by the surveys, each author was requested to present a plan which, in his opinion, represents the best practice at the present time, as shown by his interpretation of present practice in the entire group of cities.

In undertaking to set forth the health service provided in a given city consideration must necessarily be given to those public health services carried on by various nonofficial or voluntary agencies. The extent of the health activities undertaken by these private organizations varies in different cities. Aside from purely bedside nursing these agencies frequently are engaged in such activities as infant and child welfare, antituberculosis work, venereal control, and in a number of the cities in the present study, they provide nursing service for school medical inspection, communicable disease control and generalized nursing care.

It is necessary therefore, in attempting to survey local health service to give consideration to the public health activities of the private agencies. In the present survey, an effort was made to secure available details of services in order to complete the record for each city. It was not always possible to obtain complete and comprehensive data covering the services actually provided by these agencies. In the larger cities and where the private agencies are numerous and quite active, it was not feasible to attempt to secure a complete report of their activities.

The obstacles necessarily encountered in collecting all the essential information and data required for a thorough review of municipal health service in such a large group of cities are very obvious ones. That there are errors in the facts reported for individual cities those who have studied these schedules are well aware. Every effort was made to secure accurate information at the time of the survey and, as far as practicable, to check and correct the more glaring mistakes. In furnishing facts and figures, local officials at times are prone to favor their records, and some of the information given will be found to represent intention rather than actual performance or practice.

The influence of such unavoidable errors and misstatements of details for individual cities will usually become smoothed out and

averaged in presenting tabulations by groups of cities, and in the final analysis the conclusions will be found to agree very closely with the real facts.

ACKNOWLEDGMENTS

In acknowledging the many contributions made by the authors named in the table of contents, and by others, in collecting the necessary information and preparing the material for publication, special acknowledgment is made to the local health officials and their assistants, who were quite generally patient and forbearing during the interruptions necessary in connection with the field surveys. Without the voluntary assistance and cooperation of the local authorities and private agencies, individual records of cities would have suffered materially.

To the committee on municipal health department practice of the American Public Health Association who, collectively and individually, cooperated in the plans for the 1924 survey, in the selection of authors, in supplying them with photostat copies of the schedules, and for their many helpful suggestions, grateful acknowledgment is made.

The labor of compiling an enormous mass of data, its analysis and interpretation, and the preparation of manuscript for the present report has fallen largely upon the authors themselves. Every credit is due for their labors.

I. PUBLIC HEALTH ADMINISTRATION

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A. Organization and Personnel

THE PLACE OF THE HEALTH SERVICE IN MUNICIPAL GOVERNMENT

The health service of the cities included in this survey is conducted almost always by a branch of the municipal government organized especially to carry on the public health activities and designated, usually, "the department of health" or "the board of health." Only rarely are other functions combined with health service in a single administrative unit. In Kansas City, Mo., the administrative unit is designated "the hospital and health board," and in Norfolk, it is designated "the department of health and welfare." In these cities hospital service and other welfare activities are carried on as an integral part of the work of a single administrative unit which also conducts the health service, but this situation should not be confused with that in those cities in which this department has a joint title but is made up of separate units of which the health service is one.

The health organization is usually a primary unit of the municipal government, has equal rank with any other unit or department, and is responsible directly to the principal executive of the municipality. This condition holds in 76 of the 100 surveyed cities.

In 24 of the 100 cities, however, the health service is organized as a division or bureau in a major department of the city government which carries on other functions as well. In these cities the health executive is responsible not directly to the principal executive authority of the city, but to the head of the department of which the health service is a part. In 12 cities the bureau or division of health is a part of the department of public safety in which are included, usually, also the bureaus of fire and police. These cities are Albany, Duluth, Harrisburg, New Orleans, Oklahoma City, Reading, Rochester, St. Paul, Trenton, Troy, Utica, and Wilkes-Barre. In 7 cities—Cleveland, Dayton, Grand Rapids, Knoxville, Minneapolis, Richmond, and Toledo—the bureau or division of health is a part of the department of public welfare which conducts, usually, in addition, all other charitable and relief work of the municipality. In Allen-

town and Denver it is a bureau of the department of health and charities; in Jersey City, of the department of public affairs; in Oakland, of the department of public health and safety; and in Portland, of the department of public utilities.

THE FORM OF ORGANIZATION

The organization of the health departments of the surveyed cities—and in this discussion the term “department” will be used to describe a health organization whether or not that be technically its title—is in general quite uniform. Differences of some importance exist in the method of appointment of the principal executive, usually called the health officer or health commissioner, and in the method of providing for the performance of certain legislative and quasi-judicial functions, but the distribution of function among the various administrative units and the general plan of administrative control vary remarkably little when one considers the wide diversity of conditions, economic, social, racial, and climatic, which are encountered in the 100 cities surveyed. The municipal health departments of the larger cities are apparently rapidly approaching a well-defined standard.

The greatest differences in health department organization are to be found in the provisions for supervising the work of the health officer himself. Traditionally, in American health practice there was set up in the municipal government some sort of a board or commission made up, in whole or in part, of physicians, to which was given primary responsibility for the work of the health department and under whose supervision and advice the health officer carried on the detailed administration of the organization. There were several reasons for the creation of such a board or commission. It provided, first of all, an opportunity for the medical profession of the community to have a voice, through the medical members of the board, in the conduct of health affairs and made available to the health officers the experience and advice of these members. By reason of the fact that the members of the boards served usually for long periods of time, their terms not usually expiring simultaneously, it further tended to provide a continuity of policy and purpose which was often lacking when the health officer was a short-term official changing with each change in political control and coming often to his task with no previous knowledge of or experience in health work. It was further believed that such a board, composed as it was of persons chosen presumably by reason of their knowledge, experience, and general fitness rather than for political consideration, could act as a buffer between the shifting political forces of the

community on the one hand and the administration of health affairs on the other.

The creation of such a board or commission to direct an important municipal service was not limited to affairs of health. The reasons which prompted such action applied as well to the fire department, the police department, the water department and, in fact, to every important municipal activity. Boards and commissions, therefore, were an essential part of the political philosophy of municipal government as it existed during the period when most American cities organized health service. This philosophy still persists in many parts of the country and boards of health are still to be found in a majority of the larger cities. That they have served a valuable purpose is certain.

Within comparatively recent years, however, there has developed a new philosophy of municipal government in the United States which has as its central feature the idea of centralizing full responsibility for the conduct of all municipal affairs in a single executive or in a small commission. The old plan of municipal government provided for a mayor and a council of two chambers. The mayor's duties were frequently purely perfunctory, and the actual administrative conduct of affairs was in the hands of committees of the council. The increase in the volume, importance, and the technical character of so many municipal activities made it impossible to secure efficient administration under such a system of divided responsibility and a strong tendency to centralize authority has in recent years been manifest.

In 33 of the surveyed cities the mayor and council plan has been abolished in favor of the so-called commission form of government, in which all legislative and administrative responsibility is concentrated in a so-called city commission, consisting usually of five members, each member of which supervises and is responsible for the work of a group of municipal departments. Still later, further development of the idea of centralization of administrative responsibility has resulted in the appointment in eight cities of a single executive, called the city manager, who is responsible for the administration of all municipal activities. In cities where such a centralized plan has been put into effect the board of health has frequently shared the fate of other boards and commissions and given place to a plan of organization in which the health officer is given full powers and is directly responsible to the principal executive of the city government.

We find, therefore, that in 43 cities the appointive board of health is still retained as an important part of the health organization, while in 18 additional cities, some ex-officio body performs the

functions of a board of health. In 32 cities, at the other extreme, the health officer is responsible directly to some executive officer and in 7 additional cities, while the health officer is responsible only to the principal executive of the city, there has been created an advisory board, meeting usually at the request of the health officer and whose function is limited strictly to that of advising him on technical problems. The distribution of these various forms according to the form of city government is given in Table I.

TABLE I.—*The form of health organization in relation to the general type of municipal government*

Form of city government	Form of health organization			
	Appointive board of health	Ex-officio board of health	Independent executive	Independent executive with advisory board
City manager.	(2) Akron. San Diego.		(6) Cleveland. Dayton. Grand Rapids. Knoxville. Norfolk. Wichita.	
City commission.	(9) Birmingham. Dallas. El Paso. Erie. Fort Worth. Harrisburg. New Orleans. Salt Lake City. San Antonio.	(12) Allentown. Bayonne. Buffalo. Des Moines. Jacksonville. Oklahoma City. Reading. Sioux City. Spokane. Tacoma. Trenton. Tulsa.	(11) Camden. Duluth. Jersey City. Kansas City, Kans. Memphis. Newark. Omaha. Portland, Oreg. St. Paul. Washington. Wilkes-Barre.	(1) Oakland.
Mayor and council.	(32) Bridgeport. Cambridge. Canton. Cincinnati. Columbus. Detroit. Elizabeth. Evansville. Fall River. Flint. Fort Wayne. Hartford. Houston. Indianapolis. Kansas City, Mo. Lawrence. Lowell. Manchester. New Bedford. New Haven. Paterson. Philadelphia. St. Joseph. San Francisco. Savannah. Somerville. South Bend. Springfield. Waterbury. Wilmington. Worcester. Youngstown.	(6) Atlanta. Chicago. New York. Peoria. Providence. Richmond.	(15) Albany. Baltimore. Los Angeles. Lynn. Milwaukee. Nashville. Pittsburgh. Rochester. St. Louis. Schenectady. Scranton. Seattle. Toledo. Troy. Utica.	(6) Boston. Denver. Louisville. Minneapolis. Syracuse. Yonkers.

As will be seen from this table, 32, or 54 per cent, of the 59 cities governed under the "mayor and council" plan retain an appointive board of health, while 9, or 27 per cent, of the cities governed by a commission and 2, or 25 per cent, of the cities with a city manager still have such a board. In general the board of health is more commonly found in the smaller than in the larger cities. Of the 72 cities under 250,000 in population, 36, or one-half, have an appointive board of health, while of the 28 cities over 250,000 in population, only 8, or 28.6 per cent, have such a board.

THE APPOINTIVE BOARD OF HEALTH

The number of members of the appointive boards of health in the surveyed cities varies from 3 to 15, but is usually 3, 5, or 7. Of the 43 appointive boards of health, 17 have three members, 4 four members, 11 five members, 3 six members, 6 seven members, 1 (Fort Worth) eleven members, and 1 (Dallas) fifteen members.

The members of these boards are appointed usually by the mayor. This holds for 37 of the 43 cities having boards of health. Of the remaining 6 cities, in Birmingham the board of health is appointed by the county medical society; in Fort Worth, Salt Lake City, and Harrisburg by the city commission; in Springfield by the council; and in Lawrence by the director of the department of health and charities.

The law creating the board of health usually specifies that a certain number of members of the board shall be physicians. This is true in 27 of the 43 cities. In 6 of these cities—Philadelphia, Birmingham, Tulsa, El Paso, Evansville, and San Diego—it is required that all members be physicians, and in 4 additional cities—Erie, Houston, Worcester, and Fort Wayne—the law requires that a majority of the members of the board shall be physicians. In the remaining 17 cities requiring physicians as members of the board the number varies from 1 to 3, except in Dallas, where 7 of a total of 15 members of the board are required to be physicians.

The term of office of members of the appointive boards of health varies from two to ten years. In 12 cities it is two years, in 10 three years, in 11 four years, in 7 five years, in 1 six years, in 1 seven years, and in 1 (Cincinnati) ten years. In only 19 of the 43 cities with appointive boards of health do the terms of all members expire simultaneously. The remaining 24 cities make use of the device of rotating terms to provide for that continuity of program and policy so necessary in health service.

In only 16 cities do members of the appointive boards of health receive any compensation for their services. The compensation paid

varies widely. In Flint board members receive \$4 per meeting and in San Antonio \$5 per meeting. In South Bend the members are paid \$100 each per annum. The Lawrence members receive \$100 and the chairman \$300 per annum. In Indianapolis the president receives \$500 and other members \$100 per annum. In Manchester members receive \$200 each per annum, in Fall River \$250, in Lowell and New Bedford \$700. In Worcester the chairman receives \$800 and other members \$500 per annum. In 3 cities it is stated that a certain sum is paid without specifying the distribution. In Wilmington a total of \$300 is paid to a board of five members. In Fort Wayne it is stated that \$2,050 is paid to the members of a board of three, while in Evansville \$1,700 is paid to a board of the same size.

Meetings of the board are held weekly in 6 cities, twice a month in 9 cities, monthly in 24 cities, on call only in El Paso, at six-week intervals in Philadelphia, and are stated to be held three times a month in Indianapolis and eight times a month in New Bedford.

The health officer is ex officio a member of the board in only 14 of the 43 cities with appointive boards of health. In Philadelphia, New Orleans, and Flint, of this group, the health officer is president of the board, and in Lawrence he is chairman. In 5 cities of this group the health officer is secretary or clerk of the board. Of the 29 cities in which the health officer is not a member of the board, he acts as secretary to the board in 2, Lowell and Wilmington.

The functions performed by the board of health in the cities under consideration are for the most part legislative and advisory. In only 1 city (Lawrence) does the board of health seem to assume responsibility for the actual direct administrative work of the department of health.

In all of the 43 cities the appointive boards of health act in an advisory capacity to the health officer. In all but 1 city (South Bend) the board is given power to make rules and regulations in matters affecting the public health, and these rules and regulations have usually the force of law. In South Bend these rules and regulations are made by the city council.

The board of health is given the power to appoint the health officer in 26 of the 43 cities. In the remaining 17 cities this power, the provision of which is one of the most potent arguments in favor of the existence of such a board, is exercised not by the board but by the mayor, city council, or city commission, as the case may be. In Philadelphia, Kansas City, Mo., El Paso, Evansville, Fort Wayne, Houston, and San Antonio, of this group, the health officer is appointed by the mayor. In Erie, Flint, and Savannah the health officer is elected by the council. The health officer is appointed by the city commission in Salt Lake City, Dallas, Fort Worth, Harris-

burg, and New Orleans. In Lawrence the appointment is made by the director of health and charities, and in San Francisco by the civil-service commission.

In 24 of the 43 cities the board of health is charged with the duty of appointing subordinate employees. In 8 cities subordinate employees are appointed by the health officer with the approval of the board. In 3 cities the appointment is made by the health officer, in 1 city by the health officer subject to the approval of the mayor, and in 1 other subject to the approval of the director of public safety. In the remaining 6 cities appointments to subordinate positions in the health department are made by some agency outside the department, the mayor, city commission, or city council, as the case may be.

In only 17 of the 43 cities with appointive boards of health does the board possess the very important power of fixing the salaries of its employees. In Youngstown the health commissioner fixes salaries, subject to the approval of the board.

Summing up the findings of the survey in regard to the appointive boards of health, we find the plan in operation in almost exactly the same proportion of the cities as was found in the first survey (1920), in which 37 out of 83 cities (44.5 per cent) had such a board as contrasted with 43 of 100 cities in this survey.

While boards of health thus persist, however, they usually exercise but little influence upon the actual conduct of affairs in the health departments of which they remain a part. In only a little more than half the cities does the board have the power of appointing the health officer or subordinate officials, and in less than 40 per cent of the cities does the board fix the salaries of its employees. The only functions generally exercised by these boards of health are those of advising the health officer and making rules and regulations.

THE EX OFFICIO BOARD OF HEALTH

As previously stated, in 18 cities some ex officio body has been created or designated to perform all or some of the functions performed by an appointive board of health where one exists. These ex officio boards are variously constituted. In 9 of the 18 cities, the city commission, the general governing body of the city, acts as a board of health when dealing with health matters. In such a case the designation "board of health" is largely a legal fiction, since the commission is in reality acting in the same relation to the health department as to other departments of government.

Of the remaining 9 cities in this group, Chicago, where an ex officio board consisting of the health commissioner, the city physician, and the chief of police is provided for by law, reports that

the board has no functions and never meets. In New York an ex officio board consisting of the health officer of the port, the health commissioner, and the police commissioner acts only as a legislative and advisory body except in emergency, when its very broad powers may be exercised.

In Des Moines the city council acts as a board of health and is required by law to approve the more important actions of the health commissioner. In Oklahoma City the commissioner of public safety, the commissioner of health, and the secretary of the health department constitute legally the board of health, but in practice important powers are stated to be exercised by the health commissioner with the approval of the commissioner of public safety.

In Richmond the mayor and his advisory board, consisting of the heads of the four administrative departments of the city government, acts as a board of health. The members of this board are the personal appointees of the mayor, removable at his pleasure.

In Tacoma the mayor, the health officer, and one member of the city council constitute a board of health, whose powers are advisory only. In Peoria a group of seven city officials, the exact titles of whom are not specified, is organized as a board of health and has certain limited legislative and advisory powers. In Atlanta the sanitary committee of the council appoints the health commissioner and all other except minor employees of the health department, makes general rules and regulations, and hears appeals from orders of the health commissioner. Salaries are fixed by the finance committee of the council.

In Providence the mayor and board of aldermen (10 members) constitute the board of health. The health officer (superintendent of health) is elected by the city council. Subordinate employees are appointed by the health officer with the approval of the board of aldermen, which body also fixes salaries, makes rules and regulations, and issues orders. The health officer promulgates special emergency regulations when necessary.

ADMINISTRATIVE PROCEDURE UNDER CITY-MANAGER GOVERNMENTS WITHOUT BOARDS OF HEALTH

The 39 cities without a board of health, either appointive or ex officio, include 6 (Cleveland, Dayton, Grand Rapids, Knoxville, Norfolk, and Wichita) in which the city-manager plan of municipal government is in effect.

In Cleveland the health service is a division of the department of public welfare and the commissioner of health is appointed by the director of welfare. Appointment of subordinates is made by the

commissioner under the provisions of civil service and salaries are fixed by ordinance of the city council. Rules and regulations without penalty are made by the commissioner who also issues orders, abates nuisances, and makes special regulations in emergency. Sanitary regulations requiring court action for enforcement are made by the city council.

In Dayton also the health service is a division of the department of public welfare. The commissioner and subordinate employees are appointed by the city manager through the director of welfare. Salaries are fixed and rules and regulations are made by the city commission. Orders are issued by joint action of the director of welfare and commissioner of health, and appeals from orders are heard by the director and the city commission, by whom also emergency regulations are promulgated.

In Grand Rapids the health service is likewise a part of the department of public welfare. The health officer is in direct charge of administrative matters and appoints subordinates under civil service regulation. Salaries are fixed by the city commission, but the health officer makes rules and regulations, issues orders and hears appeals, abates nuisances and promulgates orders in emergency. The person by whom the selection of the health officer is made is not stated.

In Knoxville a new plan of organization, adopted but not fully in operation at the time of the survey, places the appointment of the health officer and his subordinates in the hands of the city manager through the director of public welfare. Rules and regulations are to be made by the city council on recommendation of the city manager. The health officer issues orders, abates nuisances, and promulgates emergency regulations. Appeals from orders of the health officer are heard by the city manager or council.

In Norfolk health and welfare are combined in a department of welfare, the commissioner of health acting also as commissioner of welfare. The commissioner is appointed by the city manager and salaries are fixed by the council. Subordinate employees are appointed by the commissioner who also issues orders, hears appeals, abates nuisances, and promulgates emergency regulations. Rules and regulations are made by the council.

Wichita has also combined the functions of welfare director and health officer. The director is appointed by the city manager and these two officials appoint subordinates and fix salaries. The health officer makes rules and regulations, issues orders, abates nuisances, and promulgates emergency regulations. Appeals are heard by the courts.

ADMINISTRATIVE PROCEDURE UNDER COMMISSION GOVERNMENTS
WITHOUT BOARDS OF HEALTH

In the 12 cities governed by the city commission system and without a board of health the distribution of powers and duties is quite varied.

Appointment of the health officer is by the mayor in Memphis and Portland and by the mayor subject to confirmation by the city commission in Omaha. It is made by the city commission in Camden, Newark, and Washington and by the council in Wilkes-Barre. The health officer is appointed by civil-service authority in Jersey City, and Kansas City, Kans., and by the commissioner of public safety in Duluth, Oakland, and St. Paul. In St. Paul, however, the appointment must be confirmed by the full commission.

The method of appointment of subordinate employees is likewise varied in this group of cities. In Memphis only is the health officer empowered to choose his own subordinates, although in Camden, Jersey City, Omaha, and Washington appointment by the commission is upon recommendation by the health officer. In Duluth the director of public safety appoints under civil-service regulation. In Kansas City, Kans., appointment is by the commissioner of parks and public property, of whose department the health service is a part; in Newark by the mayor, under civil service; in Oakland in part by the health officer, under civil service, and in part by the commissioner of health and public safety; in St. Paul by the commissioner of public safety; and in Portland and Wilkes-Barre by the city commission.

Salaries of employees of the health department are fixed almost invariably by the city commission, although in Camden, Duluth, Omaha, and Washington the health officer recommends the amounts.

Power to make rules and regulations of general application is generally lodged in these cities in the person of the health officer. In Jersey City, Portland, Washington, and Wilkes-Barre this power is exercised by the city commission, and in Oakland by the health officer and the commissioner of public health and safety. Orders are issued in this group in the name of the health officer except in Jersey City, where the mayor, and in Wilkes-Barre the superintendent of public safety, may issue orders. Appeals from orders by the health department in commission governed cities are heard usually by the courts, although in Jersey City they are heard by the mayor and in Oakland and Washington by the commission. In Newark, Omaha, and Portland the health officer and in Oakland the commissioner of public health and safety are said to hear the appeals.

Nuisances are abated on order of the health officer in 10 of the 12 cities. No information is available on this point for Duluth, and

in Washington orders are issued by the commissioners on recommendation of the health officer.

Emergency regulations may be promulgated by the health officer alone in 9 cities, by the commissioners in Kansas City, Kans., and Washington, and upon approval of the council in Wikes-Barre.

ADMINISTRATIVE PROCEDURE UNDER MAYOR AND COUNCIL GOVERNMENTS WITHOUT BOARDS OF HEALTH

In general, the administrative procedure under the mayor and council form of city government without boards of health (21 cities) is similar to that already described for cities having the city commission plan. The appointment of the health officer and of subordinates, the fixing of salaries, the making of rules and regulations, and the promulgation of emergency regulations are powers vested in the mayor and council instead of in the city commission. The issuing of orders and the abatement of nuisances are almost invariably duties of the health officer.

Of the 21 cities under the mayor and council plan without a board of health, the health officer was a completely independent executive in 15 cities,¹ while in the remaining 6 cities² there was an advisory board.

Such advisory boards have advisory but not administrative powers, and serve invariably without pay. The boards usually consist of five members, but in Boston there are nine and in Louisville three. In Boston, Syracuse and Yonkers the board members are appointed by the mayor for a period coincident with the mayor's term of office. In Denver the manager of health appoints the members to serve for four years. In Louisville and Minneapolis the members are selected by the county medical society for indefinite and one-year terms, respectively.

ADMINISTRATIVE ORGANIZATION OF MUNICIPAL HEALTH DEPARTMENTS

The internal organization of the departments of health included in the survey exhibits a considerable degree of uniformity. In general, the work of the health department is divided into seven units. General administration, including all that is involved in personnel and finance, is usually carried on by the division of administration under the direct control of the administrative head of the department. Vital statistics is ordinarily also set up as a separate unit under the direction of the registrar or chief clerk.

¹Albany, Baltimore, Los Angeles, Lynn, Milwaukee, Nashville, Pittsburg, Rochester, St. Louis, Schenectady, Scranton, Seattle, Toledo, Troy, Utica.

²Boston, Denver, Louisville, Minneapolis, Syracuse, Yonkers.

The next important division is that of communicable diseases, under which are included the ordinary acute contagious diseases and tuberculosis and venereal disease. Tuberculosis and venereal disease control are, however, sometimes set up as independent primary divisions of the organization but more frequently as separate divisions of the general unit for communicable disease control. Activities in connection with maternal, infant, and child hygiene are usually centered in a division of child hygiene or child welfare, which may be subdivided into units for infant hygiene, maternal welfare and school medical inspection. Sanitary inspection is usually carried on in a separate unit, although plumbing inspection and housing inspection may be separated either as primary units or as subdivisions of the division of sanitation. Food and milk inspection is usually also a separate unit which may be subdivided. The laboratory is almost invariably a separate unit.

These seven primary divisions, administration, vital statistics, communicable disease, child hygiene, sanitary inspection, food and milk inspection, and laboratories, may be considered as the typical or basic form of municipal health administration. The number of bureaus or divisions in the health departments vary somewhat with the size of the cities considered, the tendency being, of course, in the larger cities to a greater subdivision than is possible in the smaller cities.

Cities of Group I.—The 12 cities over 500,000 in population conform, in general, to the plan above outlined. In Baltimore there is an interesting variation in that the bacteriological laboratory is a separate unit while the chemical laboratory is combined with general food inspection in a division of chemistry and food. A part of the nursing service of this department is conducted on a specialized plan under the division of child hygiene, but the major portion of the nurses attached to the department operate under a division of nursing on a semigeneralized system.

In Boston the work of communicable-disease control, including venereal diseases, and of infant hygiene, together with the supervision of the health units, is carried on under the medical division, while records and accounts are kept in a division of vital statistics, records, and accounts.

In Buffalo communicable-disease control and vital statistics are included in a division of vital statistics, and there are separate units for general sanitary inspection and for plumbing and drainage. There is also a separate division of publicity and health education.

In Chicago venereal-disease control is administered under a separate bureau, and the hospitals for smallpox, communicable diseases,

and venereal diseases, together with the communicable-disease ambulance service, are organized into an administrative unit.

In Cleveland tuberculosis control is organized as a separate bureau.

In Detroit there is a bureau of medical service with divisions of tuberculosis, communicable disease, venereal disease, child welfare, school inspection, dental inspection, and nursing. Under this bureau also are administered the communicable-disease hospital and the tuberculosis hospital. All sanitary inspection is centered in a bureau of sanitary engineering. Vital statistics and statistical research are combined in a bureau of vital statistics and research, and there is a bureau of education and publicity.

In Los Angeles milk inspection and inspection of other foods are separately administered and there is a division of tuberculosis and one for venereal disease. Maternal and child hygiene are carried on, the first under a maternity division and the second under the division of nursing.

In New York there is a bureau of preventable diseases and separate bureaus of industrial hygiene and of publicity and education.

In Philadelphia there is a bureau of medical inspection and a separate bureau of tuberculosis. There are separate divisions of bacteriology and chemistry and separate divisions for the inspection of public schools and of private schools. Meat and cattle inspection and milk inspection are also separated. The municipal hospitals are administered in a bureau of hospitals which together with the bureau of health makes up the department of health.

In Pittsburgh the work of the health department is administered under five bureaus, infectious diseases, child welfare, food, sanitation, and smoke.

In San Francisco the following bureaus and divisions are listed: Sanitation, laboratories, dairy and milk inspection, meat and market inspection, plumbing inspection, industrial inspection, tenement-house inspection, school-health inspection, child welfare, tuberculosis, and hospitals.

In St. Louis there are divisions of administration, communicable disease, sanitation, laboratory, venereal disease, fumigation, and vital statistics.

Cities of Group II.—In the 16 cities of Group II, with between 250,000 and 500,000 population, the administrative organization of the health department is more uniform than in the larger cities. Practically all contain the seven major divisions referred to above, with additional divisions for tuberculosis and venereal disease control, and, in addition, a considerable number of divisions of nursing.

In Cincinnati the work of child hygiene is carried on under the nursing division on a generalized system, and there is no separate

division of child hygiene. There is a separate division for tuberculosis control. The same plan is followed in Columbus, except that tuberculosis work is conducted by a voluntary organization and there is in the health department a unit of work for the medical relief of the poor.

In Denver there is no division of vital statistics or of sanitary inspection. There is a division of fumigation and quarantine, and separate units for the school physicians, the tuberculosis dispensary, milk inspection, market inspection, food inspection, and meat inspection. There is no child-hygiene division. Two visiting nurses and one child-hygiene worker are paid by the city. The city physician, the venereal disease and jail physician, and the tuberculosis dispensary, as well as the hospitals for smallpox and contagious diseases, constitute separate units.

In Indianapolis the usual seven divisions are found with additional units for tuberculosis, venereal disease, and plumbing inspection. Food inspection is divided into two units, one for milk and food and the other for meat.

In Jersey City there are only four divisions—medical, child hygiene, sanitary, and city hospital. Kansas City, Mo., has no division of child hygiene. Louisville has no division of vital statistics but has separate units for venereal-disease control, tenement-house inspection, industrial hygiene, and medical relief of the poor.

In Milwaukee the bureau of administration is divided into divisions of accounts and of vital statistics; the bureau of child hygiene into divisions of child hygiene and school hygiene. The bureau of contagious diseases is organized into divisions of diagnosis and quarantine, and isolation hospital. There are separate divisions of tuberculosis, venereal diseases, and field nursing. The bacteriological and chemical laboratories are separately administered.

Newark, in addition to the seven principal divisions, has separate units for tuberculosis control, venereal-disease control, parochial-school hygiene, and plumbing inspection. Food inspection is separated into divisions of food and drugs and of meat inspection. A city dispensary is also operated as a separate unit.

In New Orleans vital statistics is a part of the division of administration. There are separate units for tuberculosis control, venereal-disease control, nursing, rat eradication, and isolation hospital, and separate laboratories of bacteriology and chemistry.

In Portland, vital statistics is a part of the administrative division, and there are separate units for the inspection of milk and meat and a separate division of hospitals. In Rochester communicable-disease control is centered in a division of epidemiology, and food and gen-

eral sanitary inspection are combined in one division. In Seattle there are, in addition to the usual seven divisions, separate units for tuberculosis control, plumbing inspection, the administration of the city hospital, garbage disposal, and markets. In Toledo there is no division of child hygiene, but medical relief for the poor and the municipal hospital are administered in separate units.

In Washington there are separate units of administration for child welfare and school hygiene. Sanitation and the tuberculosis and venereal disease clinics are organized as separate units.

Cities of Group III.—The cities of Group III, between 100,000 and 250,000 in population, conform in general to the seven divisional types of organization previously referred to. In this group of cities, however, the divisional organization is in general not particularly well defined, as some activities are carried on by one or two employees who report directly to the health officer rather than through a divisional chief.

In four cities of this group it is stated that there is no definite divisional organization—Albany, Des Moines, Oklahoma City, and Trenton. The principal deviations from the usual type are in the direction of unifying child hygiene and other nursing activities in a general nursing division, known usually as the division of nursing. This arrangement is found in 9 cities. Another variation is the combination of sanitary inspection into a single unit known sometimes as the division of food inspection and sanitation, sanitary police, or simply inspection. This practice is found in 4 cities. Separate units for venereal disease and tuberculosis control exist in a majority of these cities and in a number of cities milk inspection is separated from the inspection of other foods. Four cities have separate units for mosquito control and 3 cities have divisions of dental hygiene. Many miscellaneous activities not directly connected with health administration are carried on by the health departments of this group usually as separate units.

Cities of Group IV.—In the cities of Group IV the number of health department employees does not generally justify the organization of definite divisions of work, and where such divisions are designated in the survey, these are manifestly in most cases functional rather than administrative units, the health officer usually assuming direct control over all activities of the health department.

THE HEALTH OFFICER

Qualifications.—The qualifications prescribed for appointment as health officer vary greatly in the surveyed cities. In 8 cities no qualifications whatever are prescribed and in 35 cities the only expert

qualification is that the health officer be a physician. In 11 of these 35 cities it is required that the health officer be a physician resident in the city, and 11 other cities require that the health officer shall have had experience in the practice of medicine. The period of required professional experience varies from 10 years in New York City to 3 years in Erie, Hartford, and Oklahoma City. The usual period required is 5 years. The remaining 13 cities require only that the health officer be a physician.

Five cities—Boston, Canton, Lowell, New Bedford, and New Haven—specify special training in public health, and four cities—Akron, Dallas, Indianapolis, and Omaha—require that the health officer shall have had municipal health experience. Detroit and Milwaukee require that the health officer shall be either a doctor of medicine or doctor of public health. Bridgeport requires that he be “a discreet person, learned in medicine and sanitary science.” Fall River requires that the health officer shall pass an examination and be a resident of the State for the year previous to appointment. In Fort Wayne the applicant for appointment as health officer must be approved by the State board of health, and in Kansas City, Kans., he must be a physician “versed in chemistry and bacteriology.”

In Jersey City the title of medical director is given to the position charged with general direction of affairs in the health department and for all medical activities in the fire, police, and other city departments. The medical director, serving only part time, is also in charge of the municipal hospital. The position of health officer has been assigned for a number of years to a layman, who is directly responsible for the sanitary division and reported as performing the executive duties of health officer under the general direction of the medical director. (Since the completion of the survey for 1923, it has been reported that the position of medical director has been abolished.)

The only uniform requirements are found in the cities located in the States of New Jersey and New York, where definite qualifications for appointment are prescribed by the State law.

Method of appointment.—Three principal methods for the appointment of health officers are found. In 26 of the 100 cities the health officer is appointed by the board of health. In 29 cities he is appointed by the mayor, and in 20 cities by some other city official, usually the director of the municipal department of which the health organization is a part. In 4 of these cities, however, appointment is by the city manager. The health officer is elected by the city council in 8 cities and by the city commission in 14 cities. In

San Francisco, Kansas City, Kans., and Jersey City it is stated that the health officer is appointed by the civil service commission.

Before appointment to the position of health officer for any city in the State of New Jersey, the applicant or candidate is required to obtain a license issued by the State department of health upon satisfactory examination. Persons so licensed as health officers are eligible to appointment by all local boards of health within the State and after five years' consecutive service, removal from office and reduction in pay or position, except for just cause and after a public hearing, are prohibited. Similar requirements, as to licenses, apply to persons appointed as sanitary or plumbing inspectors.

TABLE II.—*Appointment of health officer—Methods of appointment classified by form of health organization*

Cities with—	Number of cities with appointment by—						Totals
	Board of health	City commission	City council	Mayor	Other city official	Civil service	
Appointive board of health.....	26	5	3	7	1	1	43
Ex officio board of health.....		6	4	5	3		18
Independent executive.....		3	1	17	16	2	39
Total.....	26	14	8	29	20	3	100

Term of office.—The term of office of the health officer is specified in 47 cities and is indefinite in 53 cities. Three cities specify a one-year term; 18 cities, two years; 3 cities, three years; 21 cities, four years; and 2 cities, five years. The term of office is stated to be indefinite in 41 cities, at the pleasure of the appointing officer in 10 cities, and during good behavior in 2 cities.

The position of health officer is under the protection of civil-service system in only 17 of the surveyed cities—Boston, Cambridge, Somerville, Springfield, Worcester, Lowell, and New Bedford in Massachusetts; Elizabeth, Jersey City, Newark, and Trenton in New Jersey; San Diego and San Francisco in California; and Canton, Kansas City, Kans., Nashville and New Haven in other States. In addition to the 17 cities in which the health officer is under the protection of the civil-service system, health officers in 25 cities are afforded some protection against removal for purely political reasons by the requirement that charges must be preferred against them and formal hearing had before removal is effective. In the remaining 58 cities the health officer may be summarily removed without recourse.

Salaries paid.—The salaries paid to health officers for whole-time service vary from a minimum of \$1,300 by one city to a maximum of

\$10,000 by four cities, and for part-time service from \$300 in one city to \$5,000 in three cities. The average salary for whole-time service is almost exactly \$5,000, and for part-time service, \$2,800. The average salary for whole-time service in the 1920 survey was \$4,800 per annum and for part-time service, \$3,104.

TABLE III.—Salaries of health officers—Frequency distribution of cities according to salaries paid health officers grouped according to size of city and whole and part time service, with mean salary for each group (100 cities)

Whole or part time service	Number of cities paying salary of—									Mean salary for group
	Under \$1,000	\$1,000 to \$1,999	\$2,000 to \$2,999	\$3,000 to \$3,999	\$4,000 to \$4,999	\$5,000 to \$5,999	\$6,000 to \$6,999	\$7,000 to \$7,999	\$10, 000	
Whole-time:										
Group I.....					1		3	3	4	\$7, 709
Group II.....					6	4	3	1		5, 154
Group III.....		1	2	8	10	6	2	1		4, 293
Group IV.....			1	2	4	1				3, 975
All whole-time.....		1	3	10	21	11	8	5	4	5, 040
Part-time:										
Group I.....			1							2, 400
Group II.....			1			1				3, 550
Group III.....		1	2	4	10	1	2			3, 197
Group IV.....	1	4	4	4	1					2, 157
All part-time.....	1	5	8	8	11	2	2			2, 800
All:										
Group I.....			1		1		3	3	4	7, 267
Group II.....			1		6	5	3	1		4, 954
Group III.....		2	4	12	20	7	4	1		3, 855
Group IV.....	1	4	5	6	5	1	0			2, 818
All cities.....	1	6	11	18	32	13	10	5	4	4, 212

Whole and part-time service.—In the surveyed cities 63 health officers are reported as giving their whole time to the duties of their office and 37 as giving part-time service. Of the latter group, one, however, the health officer of Cleveland, might with propriety be classified as whole-time, since that part of his time not devoted to the work of the health department is given to the city as superintendent of the tuberculosis hospital.

The percentage of whole-time service is almost exactly that found in the survey of 1920, when of the 83 health officers, 53, or 63.9 per cent, were reported as serving on a whole-time basis.

Combinations of duties.—Various duties are combined with those of health officer. In Birmingham and San Diego the municipal health officer is also health officer of the county in which the city is located. In Allentown and Baltimore the health officer is a member of the State health department. In Cambridge, Cleveland, and Houston the health officer is superintendent of the tuberculosis

hospital, while in Chicago he is the director, and in Nashville, chairman, of the board of managers of the tuberculosis hospital. In Dallas and Toledo the health officer is on the staff of the city hospital, and in Oklahoma City he is superintendent of the city hospital. In Manchester and Somerville he is superintendent of the contagious disease hospital. In Memphis the health officer is professor of hygiene in the State University, and in Minneapolis he is the director of hygiene for the board of education. In Norfolk and Wichita the health officer acts also as director of public welfare, and in New Haven as health officer of the port. In nine cities the health officer is officially registrar of vital statistics. He is definitely stated to engage in private practice in 21 cities.

Age.—The average age of the 98 health officers in office at the time of the survey and for whom information was obtained was 48.5 years. It was 48 years for whole-time health officers and 49.2 years for part-time health officers. Only 9 of the 98 health officers were over 60 years of age, only 4 over 65 years of age, and only 2 over 70 years of age. Only 1 health officer was under 30 years of age, and only 5 under 35 years.

TABLE IV.—*Age of health officers now in office—Frequency distributions by size of city and by whole and part time service with mean age for each group (98 cities)*

Whole or part time service	Number of cities with health officer of age (years)—										Mean age for group
	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	Over 70	
Whole time:											
Group I.....		1		1	1	4	1	1	1	1	53.4
Group II.....			2	3	2	2	5				48.3
Group III.....		2	7	4	4	6	3	1	1	1	47.4
Group IV.....	1		3		1	3					42.5
All whole time.....	1	3	12	8	8	15	9	2	2	2	48.0
Part time:											
Group I.....					1						45.0
Group II.....				1		1					47.0
Group III.....		1	1	3	5	3	4	3			49.3
Group IV.....			1		6	3	3				49.8
All part time.....		1	2	4	12	7	7	3			49.2
All:											
Group I.....		1		1	2	4	1	1	1	1	52.7
Group II.....			2	4	2	3	5				48.1
Group III.....		3	8	7	9	9	7	4	1	1	48.2
Group IV.....	1		4		7	6	3				47.0
All cities.....	1	4	14	12	20	22	16	5	2	2	48.5

Length of service.—The average length of service for part-time health officers in 1923 was 6.7 years and for whole-time health officers 9 years, the average for the group being 8.2 years. Nine-

teen health officers had been in office more than 15 years, 12 more than 20 years, and 9 more than 25 years. Eight had been in office under 1 year and 22 had served less than 2 years.

TABLE V.—*Length of service of present health officers—Frequency distribution of cities by length of service of present health officers grouped by size of city and by whole and part time service, with mean for each group (98 cities)*

	Number of cities in which health officer has served time specified										Mean length of service for group, years
	Under 1 year	1 year	2 years	3 years	4 years	5 years	5-9 years	10-14 years	15-19 years	20 years	
Whole time:											
Group I.....		1	1	1	1		3		1	3	10.9
Group II.....	2		1	1	1	1	5	2		1	7.3
Group III.....	3	3	1	1	3	4	3	4	4	4	10.1
Group IV.....	1	3		1			2		1		5.1
All whole time.....	6	7	3	4	5	5	13	6	6	8	9.0
Part time:											
Group I.....							1				6.0
Group II.....	1		1								1.5
Group III.....		4	4	3	1	1	2	1		3	7.9
Group IV.....	1	3	1	1	1		3	1	1	1	6.6
All part time.....	2	7	6	4	2	1	6	2	1	4	6.7
All:											
Group I.....		1	1	1	1		4		1	3	10.5
Group II.....	3		2	1	1	1	5	2		1	6.6
Group III.....	3	7	5	4	4	5	5	5	4	7	9.2
Group IV.....	2	6	1	2	1		5	1	2	1	6.0
All cities.....	8	14	9	8	7	6	19	8	7	12	8.2

Education and experience.—Of the 99 health officers in office at the time of this survey only 7 had special training in public health before appointment, 61 were graduates in medicine, and 24 were graduates in arts and medicine. Only 3 of the 99 are in possession of graduate degrees of public health. One health officer is a graduate only in arts, 1 a graduate only of a high school, and 1 has only a grammar-school education. Details are not given for the education of 4 health officers.

Of the health officers now in office 20 were appointed without previous experience in public health. In addition, 12, though possessing experience in medicine other than in private practice, had no health-department experience. A total of 67 are classified as having had actual experience in public health before appointment. In this number, however, are included 17 health officers in office 10 years or more but without experience prior to their appointment.

TABLE VI.—*Education and experience of 99 health officers, 1923—Classification according to qualifications at time of appointment*

Educational qualifications	Experience before appointment			
	None	In related fields only	In health department	Total
Not stated.....	1	1	2	4
Grammar school only.....	0	0	1	1
High school.....	0	0	1	1
College.....	1	0	0	1
Certificate or B. S. (Public Health).....	0	0	2	2
Medical degree.....	16	10	35	61
College and medical degree.....	2	1	21	24
Medical and special public-health course.....	0	0	2	2
Graduate degree in public health.....	0	0	3	3
Total.....	20	12	67	99

HEALTH DEPARTMENT PERSONNEL

Number of employees.—There were employed, in 1923, in the 100 health departments included in this survey 8,760 individuals, including health officers but excluding laborers and hospital personnel. These include 1,711 physicians, 2,355 nurses, 2,143 inspectors, 989 clerks and office employees, 564 laboratory workers, 197 dentists, 12 social workers, 76 veterinarians, and 623 others. Of these employees 6,842 were employed for whole-time service and 1,828 for part-time service. Physicians employed for part-time duty make up the large majority (1,476 out of 1,828) of part-time employees, dentists, and miscellaneous personnel constituting the only other large groups serving on part time.

The average health department employed almost exactly 27 persons per 100,000 of population, of whom approximately 21 were on a full-time status and approximately 6 were employed for part-time service. The number of employees per 100,000 was remarkably constant in cities of different size. It was 27.5 per 100,000 for cities over 500,000 in population, and 24 per 100,000 in cities under 100,000.

The average health department employed, per 100,000 population, 5.3 physicians, 7.3 nurses, 6.7 inspectors, 3.1 clerks, 1.8 laboratory workers, 0.6 dentists, and 2.2 social workers, veterinarians, and others to carry on its work. The distribution of these employees in cities of different size was remarkably uniform, the greatest difference being in the item of nurses, of which class the largest cities employed 8 per 100,000 and the smallest cities 6.2 per 100,000. Detailed figures for the actual numbers of different employees and for the number employed per 100,000 of population are given in Tables VII and VIII.

TABLE VII.—*Personnel employed by health departments, classified by character of personnel, by whole and part-time service, and by size of city (100 cities)*

Population group—Whole or part time service	Physicians	Nurses	Inspectors	Clerical	Laboratory	Dentists	Social work- ers	Veterinarians	All others	Total employ- ees
Group I (over 500,000):										
Whole time.....	107	1,390	928	564	343	27	2	26	256	3,643
Part time.....	913	0	28	3	1	84	1	9	91	1,130
Total.....	1,020	1,390	956	567	344	111	3	35	347	4,773
Group II (250,000–500,000):										
Whole time.....	52	373	512	174	93	10	2	15	88	1,319
Part time.....	174	0	1	2	2	2	0	4	7	192
Total.....	226	373	513	176	95	12	2	19	95	1,511
Group III (100,000–250,000):										
Whole time.....	65	473	535	190	91	26	6	11	136	1,533
Part time.....	315	0	12	7	14	31	1	4	9	393
Total.....	380	473	547	197	105	57	7	15	145	1,926
Group IV (under 100,000):										
Whole time.....	11	119	124	46	13	6	0	5	23	347
Part time.....	74	0	3	3	7	11	0	2	13	113
Total.....	85	119	127	49	20	17	0	7	36	460
All cities:										
Whole time.....	235	2,355	2,099	974	540	69	10	57	503	6,842
Part time.....	1,476	0	44	15	24	128	2	19	120	1,828
Total.....	1,711	2,355	2,143	989	564	197	12	76	623	8,670

TABLE VIII.—*Personnel, per 100,000 population, employed by health departments—Average number of physicians, nurses, inspectors, etc., per 100,000 of population classified by groups of cities according to size, and by whole and part time service (100 cities)*

Population group—Whole or part time service	Physicians	Nurses	Inspectors	Clerical	Laboratory	Dentists	Social work- ers	Veterinarians	All others	Total employ- ees
Group I (over 500,000):										
Whole time.....	0.62	8.02	5.35	3.25	1.98	0.16	0.01	0.15	1.48	21.01
Part time.....	5.26	.00	.16	.02	.01	.48	.01	.05	.52	6.52
Total.....	5.88	8.02	5.51	3.27	1.99	.64	.02	.20	2.00	27.53
Group II (250,000–500,000):										
Whole time.....	.93	6.67	9.16	3.11	1.66	.18	.04	.27	1.57	23.60
Part time.....	3.11	.00	.02	.04	.04	.04	.00	.07	.13	3.44
Total.....	4.04	6.67	9.18	3.15	1.70	.22	.04	.34	1.70	27.04
Group III (100,000–250,000):										
Whole time.....	.89	6.47	7.32	2.60	1.24	.36	.08	.15	1.86	20.97
Part time.....	4.31	.00	.16	.10	.19	.42	.01	.05	.12	5.38
Total.....	5.20	6.47	7.48	2.70	1.43	.78	.09	.20	1.98	26.35
Group IV (under 100,000):										
Whole time.....	.57	6.21	6.47	2.40	.68	.31	.00	.26	1.20	18.12
Part time.....	3.86	.00	.16	.16	.36	.57	.00	.10	.68	5.90
Total.....	4.43	6.21	6.63	2.56	1.04	.88	.00	.36	1.88	24.02
All cities:										
Whole time.....	.73	7.32	6.52	3.03	1.68	.22	.03	.18	1.56	21.28
Part time.....	4.59	.00	.14	.05	.07	.40	.01	.06	.38	5.69
Total.....	5.32	7.32	6.66	3.08	1.75	.62	.04	.24	1.94	26.97

Civil Service.—The method of appointment of subordinate health department employees has already been discussed. All subordinate employees are under the protection of civil service in 49 cities, and in 13 additional cities a part of the personnel is under the protection of civil service. In the remaining 38 cities employees may be dismissed without recourse.

Political interference.—In answer to the question as to whether or not subordinate employees are disturbed by political changes in the municipal administration, it is stated in the reports for 46 cities that the health department is not disturbed by political changes. In 27 cities it is stated positively that subordinate employees are subject to dismissal for political reasons, and in the remaining 27 cities that some employees are subject to political change or that the entire personnel is sometimes subject to such change. The status of cities in the different groups as regards civil service protection and removal for political reasons is given in detail in Table IX, from which it will be seen that in the matter of civil service protection and freedom from removal for political reasons the largest cities report conditions much better than do the smaller cities.

TABLE IX.—*Status of subordinate personnel, 100 cities, 1923—Classification by civil-service status and by liability to removal for political reasons—Number of cities in each classification*

Cities of—	Civil-service status			Liability to removal for political reasons		
	All under civil service	Part under civil service	None under civil service	All employees	Part of employees	No employees
Group I.....	9	1	2	0	2	10
Group II.....	10	6	0	5	3	8
Group III.....	22	19	9	12	17	21
Group IV.....	8	12	2	10	5	7
All cities.....	49	38	13	27	27	46

THE HEALTH DEPARTMENT OFFICE

The office of the health department is almost invariably in the city hall or some other municipal building. In Newark the health department occupies a commodious building of its own, while at the other extreme, the health department is in a general office building in 3 cities, and in the home of the health officer in 1 city. The health officer is usually provided with a private office, although in 17 cities he has only a desk in the general office, for the most part in cities under 100,000 population, although 3 cities between 250,000 and 500,000 are included.

The offices of the health department are stated to be adequate and suitable in 52 of the surveyed cities and definitely stated to be inadequate and unsuitable in 27 cities. In the remaining 21 cities the answer is equivocal.

There is some provision for a library in 42 cities, though the comment is usually made that the library is small or consists only of miscellaneous reports.

Less than half of the health departments surveyed keep any record of the time of arrival and departure of employees. Only 39 cities report such a record, the remaining 61 having no written record of the amount of time served by employees.

In response to the question as to the general "tone" of the office of the health department, answers were given for 97 cities. Of these the tone of the office is stated to be "excellent" in 23, "good" in 45, "fair" in 19, and "poor" in 10. No opinion was given in 3 cities.

The difference in the reports as to the tone of the office in cities in which the health officer serves on full time as compared with cities in which he gives only part time to the work is rather striking. Thirty-one per cent of the cities under whole-time administration are reported as "excellent" as against 12 per cent of the cities with part-time direction. Fifty per cent of the cities with a whole-time health officer are reported as "good" as against 40 per cent of cities with part-time health officers. Accepting "good" as a fair criterion, 81 per cent of the cities under whole-time administrative direction are given this rating as against 52 per cent of cities with part-time health officers. Conversely, in only 5 per cent of cities under whole-time service was the tone of the office reported as "poor" as compared with 20 per cent of cities under part-time direction.

TABLE X.—Efficiency items of office administration, 1923—General tone (97 cities)—Time records (100 cities)—Library facilities (100 cities)—Classified according to whole or part time service of health officer

	General tone of office									
	Excellent		Good		Fair		Poor		Total	
	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent
Cities with whole-time health officer....	19	30.6	31	50.0	9	14.5	3	4.9	62	100.0
Cities with part-time health officer.....	4	11.4	14	40.0	10	28.6	7	20.0	35	100.0
All cities.....	23	23.7	45	46.4	19	19.6	10	10.3	97	100.0

TABLE X.—*Efficiency items of office administration, 1923—General tone (97 cities)—Time records (100 cities)—Library facilities (100 cities)—Classified according to whole or part time service of health officer—Continued*

	Time record kept						Library					
	Yes		No		Total		Yes		No		Total	
	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent
Cities with whole-time health officer.....	50	79.4	13	20.6	63	100.0	32	50.8	31	49.2	63	100.0
Cities with part-time health officer.....	11	29.7	26	70.3	37	100.0	10	27.0	27	73.0	37	100.0
All cities.....	61	61.0	39	39.0	100	100.0	42	42.0	58	58.0	100	100.0

SUMMARY

Health service in the 100 largest American municipalities is rendered by units of government whose functions are rather strictly limited to directly preventive measures.

The health department is normally a major department of government, but in about one-fourth of the large cities it is a bureau or division in some other major department, usually that of public safety or public welfare.

There is an appointive board of health in 43 cities and an ex officio, and more or less nominal, organization designated as a board of health in 18 cities. Thirty-two cities have no board of health, and 7 have a board with purely advisory power.

The powers of appointment and removal of employees, including the health officer, of fixing salaries, making rules and regulations, issuing orders and hearing appeals are variously distributed according to the form of general municipal administration and the type of health organization.

The health departments studied conform in general to a seven-divisional type of administrative organization, tending toward a further subdivision in larger cities and to a combination of divisions in smaller cities.

The qualifications prescribed for appointment as health officer specify for the most part only that the health officer be a physician.

The health officer is appointed by the board of health in about one-fourth of the cities, by the mayor in about one-third, by some other municipal officer in one-fifth, and is elected by the council or commission in about one-fourth of the cities in the groups under consideration.

About one-half of the cities specify a definite term of office for the health officer.

The average salary of the municipal health officer is \$5,000 for whole-time service and \$2,800 for part-time service.

Something more than one-third of present health officers are employed on a part-time basis and about one-fifth are engaged in private practice of medicine.

The average health officer is 48.5 years of age and has been in office 6.7 years.

The majority of present municipal health officers (93 per cent) were appointed without special training in public health, the usual training being that of a practicing physician. About one-third of the health officers were appointed to their present positions without any previous experience in health department work.

The typical health department employs 27 persons per 100,000 of population, of whom approximately 5 are physicians, 7 are nurses, 7 are inspectors, 3 are clerks, and 2 are laboratory workers. Of the part-time employees, a large percentage are physicians.

There is apparently a significant difference in the general efficiency of office administration between those health departments under the direction of a whole-time health officer and those in which the health officer gives only part of his time to his duties.

B. Expenditures of Health Departments and for Other Municipal Health Services

The available statistical material relating to the expenditures of the health departments in 1923 in the 100 surveyed cities is not highly satisfactory. There is no standard classification of expenditures and in many health departments, particularly in the smaller cities, the accounting system apparently includes no distribution of expenditures by function. In addition, there is included in the reported expenditures a wide variety of items, some of which have but little to do with actual health service.

In Table I, on which most of the calculations of expenditures included in this study have been based, are to be found the total reported expenditures of each health department for the year 1923 and the detailed expenditures for certain specified items of health service by individual cities, grouped in the standard population groups used throughout this study, and summarized for each group and for the 100 cities as a whole. In this table are included the more important and usual health services, as follows: (1) General health administration, including health education; (2) vital statistics; (3) prevention of communicable diseases, excluding expenditures for hospitals and hospitalization; (4) prevention of tuberculosis, including field services but excluding expenditures for hos-

pitals and hospitalization; (5) prevention of venereal diseases, including field services but excluding expenditures for hospitals and hospitalization; (6) child (and maternal) hygiene, including nursing service; (7) school health service, whether by health or educational authorities, including medical and nursing cost, but excluding cost of special classes and of physical education; (8) public health nursing, only when entirely or partly carried as a separate item in the budget and not distributed among the various functions (10 cities); (9) public health laboratory; (10) inspection of milk; (11) inspection of food other than milk; (12) general sanitary inspection, excluding, where possible (but not in all cases), expenditures for plumbing inspection, mosquito control, rodent control, housing inspection, and industrial hygiene.

TABLE I.—*Municipal expenditures for health service, 1923—Total reported expenditures by boards of education for school*

	Total expenditures of health department ¹	Expenditures for specified items of health service					
		Adminis- tration ²	Vital statistics	Communi- cable disease	Tubercu- losis	Venereal disease	Maternal and infant hygiene
		A	C	D	E	F	G
Baltimore.....	{ h, pl \$605,319.45 }	\$31,105.52	\$13,454.97	\$83,027.10	\$10,720.88	\$11,957.29	\$32,833.09
Boston.....	{ h, c 510,466.99 }	36,825.21	14,339.42	131,419.93	{ 93,631.45 Not H. D. }	3,650.00	17,237.80
Buffalo.....	{ pl 388,625.36 }	32,739.99	15,176.46	17,175.90	23,655.82	6,633.56	9,417.14
Chicago.....	{ h, pl, mis 1,772,729.54 }	116,703.40	51,061.89	187,228.86	{ 691,082.64 Not H. D. }	39,000.00	32,317.63
Cleveland ³	459,519.01	11,000.20	11,014.00	84,626.97	75,980.00	8,704.00	89,106.00
Detroit.....	{ h 1,706,574.00 }	49,515.00	35,980.00	112,900.00	76,760.00	58,323.00	88,680.00
Los Angeles.....	{ h, p 375,724.96 }	39,034.42	8,627.11	35,763.78	7,074.49	33,475.65	15,877.17
New York.....	{ h, r, mo 5,202,906.28 }	562,709.99	123,257.58	619,566.36	D	D	487,198.45
Philadelphia.....	{ hg, pl 646,932.50 }	28,654.77	18,442.19	145,709.85	12,730.42	Not H.D.	141,106.02
Pittsburgh.....	{ h, g, hg, pl, mis 2,074,899.38 }	14,129.54	4,678.62	63,163.88	{ H. D. hospital }	-----	151,380.01
St. Louis.....	{ hg, mo 279,751.00 }	16,126.53	5,436.00	99,254.00	{ Not H. D. 31,963.25 }	35,412.00	{ Not H. D. 32,692.74 }
San Francisco.....	{ h, hg, p, pl, r 1,560,598.87 }	45,402.02	8,316.79	17,248.28	21,271.03	10,030.60	13,441.47
Total Group I.....	15,584,047.34	983,946.59	309,785.03	1,597,084.91	1,044,869.98	207,186.10	1,111,287.52
Cincinnati.....	133,999.00	13,621.00	3,580.00	18,000.00	11,592.00	D	6,169.00
Columbus.....	{ h, p 138,642.40 }	8,753.97	A	25,413.04	2,420.00	4,455.00	19,049.47
Denver.....	{ h, p 116,380.00 }	15,410.00	2,270.00	14,880.00	10,812.00	2,460.00	1,800.00
Indianapolis ⁴	{ pl, p, h 534,202.29 }	24,601.59	A	23,108.79	16,790.00	16,927.50	21,854.74
Jersey City.....	{ h, pl 921,682.70 }	11,413.00	By State	78,400.00	D	-----	62,500.00
Kansas City, Mo.....	{ h, g, p 1,079,203.84 }	18,762.56	3,120.00	27,492.58	{ H. D. hospital }	H. D. hospital	H. D. hospital
Louisville.....	{ p, hg 86,744.71 }	5,351.27	1,200.00	12,245.00	Not H, D.	D	H
Milwaukee.....	{ h 439,775.35 }	23,777.12	6,160.72	29,630.24	10,749.40	6,732.77	8,099.14
Minneapolis.....	{ mis 111,991.20 }	27,527.38	6,307.53	24,071.43	D	D	-----
Newark.....	{ p, pl 326,530.92 }	35,505.23	5,200.00	30,251.25	20,487.74	9,400.00	32,855.67
New Orleans.....	{ h, r 217,354.22 }	18,167.75	17,054.32	50,026.12	D	D	1,980.00
Portland, Oreg....	{ h, hg, r 116,775.06 }	13,567.99	A	12,131.99	Not H. D.	By State	By State
Rochester.....	{ h, pl, mis 263,819.92 }	44,887.65	6,572.81	8,119.02	D, H	D, H	1,298.52
Seattle.....	{ h, g, pl, r 928,954.69 }	22,993.48	3,480.00	14,811.15	9,780.00	13,772.78	12,887.18
Toledo ⁵	{ h 158,099.76 }	4,200.00	2,550.00	36,900.00	{ Not by city }	City hospital	Not official
Washington.....	{ pl 221,710.00 }	33,940.00	9,010.00	55,710.00	7,740.00	4,960.00	18,000.00
Total Group II.....	5,795,866.06	322,479.99	66,505.38	461,190.61	90,371.14	58,708.05	186,493.72

* Capital letters appearing under any item indicate that the expenditure for such item is included in the columns designated by the capital letters, and that such expenditures could not be accurately segregated.

¹ Total expenditures of health department do not include such expenditures as those for school health service by board of education, but usually do include certain items not shown in the other columns of this table. Such items when included in total are indicated as follows: h, hospitals; p, poor relief; hg, housing; pl, plumbing; r, rodent control; mo, mosquito control; mis, miscellaneous; g, garbage; c, comfort stations.

² Including education and publicity.

³ All figures in this table, except those in this column, represent expenditures by the health department unless otherwise indicated.

*penditures of health departments, expenditures for specified services, including health service, with total for the services specified **

Expenditures for specified items of health service							
School hygiene		Public-health nursing ⁴	Laboratory	Control of milk	Control of food	Sanitary inspection ⁵	Total for specified items
By health department	By board of education ³						
H	I	J	K	L	M	N	
\$43,948.58	-----	\$165,158.89	\$32,559.65	\$41,401.60	\$19,053.79	{ pl \$63,084.25 }	\$548,305.61
-----	\$144,707.46	{ (38,648.52) D, G }	33,433.02	45,720.94	40,236.91	{ mo 107,572.03 }	668,774.17
78,634.97	-----	{ (59,700.00) E, F, H }	48,637.23	25,760.00	20,648.68	7,552.72	286,032.47
255,048.66	-----	{ (209,000.00) E, H }	66,769.18	75,360.00	123,124.40	89,907.59	1,727,604.25
G	156,317.46	{ (171,800.00) D, E, G, H }	20,070.00	63,389.84	13,955.00	61,673.00	595,836.47
205,140.00	-----	{ 3,060.00 (316,100.00) D, E, F, G, H }	48,480.00	41,430.00	48,350.00	60,670.00	829,288.00
-----	106,635.00	94,117.71	20,218.85	30,600.48	37,776.54	{ i 45,214.30 }	474,415.50
464,954.00	-----	{ (1,175,000.00) D, E, F, G, H }	337,808.39	M	344,580.18	{ r 374,805.76 }	3,314,880.71
D	224,992.00	{ (144,096.00) E, G }	74,975.76	30,233.04	14,612.64	123,367.61	814,824.30
G	38,961.10	{ (69,474.00) D, E, G, H }	23,666.16	85,606.87	L	{ hg 85,250.34 }	466,836.52
} D	91,217.76	Not H. D.	38,589.93	K	6,525.00	{ r, hg 79,542.00 }	436,759.21
62,089.69	-----	{ (62,865.71) E, G, H }	19,077.45	13,421.23	51,574.77	3,854.30	265,727.63
1,109,815.90	762,830.78	{ 262,336.60 (2,246,684.23) }	764,285.62	452,924.00	720,437.91	1,102,493.90	10,429,284.84
25,138.00	-----	{ (24,330.00) E, G, H }	5,220.00	6,501.00	22,364.00	17,560.00	129,745.00
-----	9,400.00	{ (18,420.00) D, E, G }	5,104.49	9,944.00	27,478.50	18,837.06	130,855.53
3,480.00	64,435.00	{ 2,400.00 (5,110.00) E, F }	12,240.00	4,680.00	23,988.00	{ Not H. D. 38,162.37 }	197,017.37
44,413.60	-----	{ (67,620.00) E, F, G, H }	5,672.41	6,888.81	15,610.00	12,000.00	187,867.44
22,000.00	71,102.00	D, G, H	26,800.00	6,000.00	N	69,310.00	347,525.00
} -----	80,000.00	{ H. D hospitals (16,900.00) D, F, H }	9,000.00	77,868.72	L	51,825.26	268,069.12
17,972.15	-----	{ (16,900.00) D, F, H }	6,387.91	M	27,062.73	8,091.41	78,310.47
43,872.94	-----	107,683.55	18,918.00	M	48,419.60	42,521.05	346,564.53
-----	139,366.00	{ (21,360.00) D }	12,736.75	35,348.94	L	L	245,358.03
8,659.77	93,433.26	{ (47,620.00) E, F, G, H }	32,680.57	29,000.00	17,759.75	{ i 63,679.61 }	378,912.85
-----	24,224.00	{ (19,500.00) D }	20,804.28	M	43,848.98	{ mo 29,856.20 }	205,961.65
9,696.09	-----	{ (15,420.00) E, H }	3,848.59	16,321.64	11,267.07	{ r, hg 22,681.64 }	89,515.01
96,505.61	-----	{ (75,900.00) G, H }	15,888.86	12,967.34	N	18,510.84	204,750.65
-----	33,020.00	{ (32,680.00) D, E, F, G }	15,240.00	8,520.00	17,100.00	23,280.00	174,884.59
} -----	(?)	{ (34,500.00) D }	13,280.00	M	25,591.90	25,440.00	107,961.90
-----	41,860.00	{ (20,805.00) D, E, F, G }	16,360.00	M	41,180.00	{ i 15,750.00 }	244,510.00
271,738.16	556,840.26	{ 110,083.55 (400,165.00) }	220,181.86	214,040.45	321,670.53	457,505.44	3,337,809.14

⁴ Figures in parentheses represent salaries of nurses (in some cases also other nursing expenditures) already included under columns indicated by capital letters.

⁵ Where such items as plumbing inspection (pl), housing inspection (hg), mosquito control (mo), rodent control (r), or industrial hygiene (i) are shown, it indicates that they could not be segregated from other sanitary inspection, and are therefore included.

⁶ Total is for 1923, but specified items are for 1922 except that venereal disease is for 1923.

⁷ 1924 appropriation.

⁸ 1924 expenditures.

⁹ 1922 expenditures, except laboratory, 1923.

TABLE I.—*Municipal expenditures for health service, 1923—Total reported expenditures by boards of education for school health*

	Total expenditures of health department	Expenditures for specified items of health service					
		Adminis- tration	Vital statistics	Communi- cable disease	Tubercu- losis	Venereal disease	Maternal and infant hygiene
		A	C	D	E	F	G
Akron.....	{ h 137,015.00 }	11,105.00	5,185.00	24,010.00	7,180.00	7,280.00	14,800.00
Albany ⁷	{ g, h, pl 82,015.00 }	8,160.00	{ Not H.D. 4,600.00 }	11,000.00	500.00	-----	-----
Atlanta.....	{ h, p, pl, mo, mis 98,011.70 }	8,374.77	{ By State }	5,624.00	-----	-----	4,844.00
Birmingham.....	71,668.53	1,620.00	1,950.00	6,900.00	D	3,225.00	9,325.00
Bridgeport.....	{ g, h 336,143.00 }	9,575.00	4,350.00	13,600.00	D	D	44,458.00
Cambridge.....	{ h, p 151,710.02 }	11,278.72	By State	8,921.20	3,631.93	-----	6,035.87
Camden ⁷	{ h 90,460.00 }	8,900.00	A	6,000.00	D	200.00	8,760.00
Dallas.....	{ h 135,796.01 }	8,911.86	3,670.49	25,180.53	-----	8,547.08	J
Dayton.....	{ p 76,325.00 }	11,215.00	By State	30,830.00	-----	{ Not H.D. 4,200.00 }	D
Des Moines.....	{ h 50,990.05 }	9,580.00	By State	4,578.32	By county	{ Not H.D. 2,700.00 }	Not H. D.
Duluth.....	¹⁰ 89,675.00	8,440.00	A	7,300.00	3,485.00	7,910.00	1,760.00
Elizabeth.....	{ h, pl, mis 61,850.00 }	7,940.00	-----	7,245.00	D	2,000.00	10,839.64
Erie.....	{ h, pl 44,795.00 }	5,075.00	A	6,645.00	-----	600.00	3,160.00
Fall River.....	{ h, pl 150,338.86 }	15,500.00	{ Not H.D. 2,065.00 }	23,500.00	5,000.00	By State	15,000.00
Flint.....	{ pl 76,858.37 }	13,887.68	1,352.17	11,340.26	By county	3,146.82	10,756.82
Fort Worth.....	{ 18,947.00 }	2,420.00	A	3,290.00	-----	-----	-----
Grand Rapids....	{ h, pl 210,232.22 }	12,380.00	1,600.00	5,138.00	{ H. D. hospital }	{ Not H.D. 3,546.00 }	8,984.00
Hartford.....	{ h 147,047.00 }	11,218.33	2,700.00	5,751.20	-----	2,880.44	21,046.84
Houston.....	{ p, g, mo 11 232,910.10 }	9,550.00	1,600.00	11,157.30	-----	17,857.64	Not H. D.
Jacksonville.....	{ mo, p, mis 110,170.67 }	9,933.61	A	11,561.48	1,091.10	6,549.44	4,846.42
Kansas City, Kans.....	{ 34,500.00 }	5,000.00	Not H. D.	10,300.00	-----	1,000.00	-----
Lowell.....	{ h, g, pl 178,460.48 }	6,819.30	751.20	24,794.36	4,008.46	3,329.60	6,070.49
Lynn.....	{ h, pl, mis 122,629.65 }	4,798.52	1,196.00	2,337.33	{ H. D. hospital }	By State	H
Memphis.....	{ p, mo, mis 110,935.20 }	8,182.50	By State	12,075.69	D	D	6,598.33
Nashville.....	{ p 67,006.04 }	8,650.00	By State	12,500.00	D	5,300.00	16,100.00
New Bedford....	{ h, pl 194,780.64 }	18,524.74	By State	6,389.86	5,590.00	5,083.45	19,192.98
New Haven.....	{ p 10 96,079.25 }	10,600.00	By State	15,575.00	5,000.00	4,000.00	4,000.00
Norfolk.....	{ h, p 10 135,327.00 }	12,610.00	A	11,155.00	5,760.00	3,415.00	3,360.00
Oakland.....	{ pl, mis 120,136.00 }	3,302.00	9,263.00	9,536.00	3,120.00	1,595.00	1,530.00
Oklahoma City..	{ h, g 119,000.00 }	8,460.00	2,500.00	6,600.00	Not H. D.	500.00	J
Omaha.....	{ h, g, pl, mis, hg 12 162,097.00 }	8,700.00	1,800.00	5,520.00	3,420.00	6,600.00	-----
Paterson.....	{ h, pl 94,731.21 }	14,116.86	3,310.61	1,950.00	{ H. D. hospital }	2,220.90	6,509.17
Providence.....	{ g, p, r, mo 181,924.48 }	8,746.97	16,676.87	12,617.12	State clinic	{ State and U. S. }	5,406.20

⁷ 1924 appropriation.¹⁰ Total is for 1923, specified items are 1924 estimates.

penditures of health departments, expenditures for specified services, including service, with total for the services specified—Continued

Expenditures for specified items of health service							
School hygiene		Public-health nursing	Laboratory	Control of milk	Control of food	Sanitary inspection	Total for specified items
By health department	By board of education						
H	I	J	K	L	M	N	
33,480.00	-----	{ (58,660.00) D, E, F, G, H }	5,185.00	6,100.00	4,070.00	5,520.00	123,915.00
-----	22,000.00	{ (4,400.00) D }	7,500.00	6,520.00	1,400.00	5,400.00	67,080.00
19,932.34	-----	{ (19,720.00) D, G, H }	4,980.00	6,240.00	11,360.00	{ Not H. D. 17,240.00 }	78,595.11
-----	6,519.47	{ (23,860.00) D, F, G }	11,425.33	22,277.20	L	13,918.00	77,160.00
-----	43,038.00	{ (39,700.00) D, G, H }	9,060.00	4,500.00	N	11,700.00	140,281.00
24,643.29	-----	{ (26,036.21) D, E, G, H }	1,650.00	3,738.77	3,871.66	10,271.90	74,043.34
-----	16,808.00	{ (7,860.00) D, G }	5,600.00	2,550.00	L	4,750.00	53,568.00
-----	-----	14,106.73	10,000.00	13,125.00	7,646.63	18,580.69	109,769.01
D	13,160.00	{ (17,800.00) D }	7,200.00	M	27,080.00	M	93,685.00
-----	45,881.96	{ 1,800.00 (3,999.60) D }	2,405.58	2,531.07	7,820.00	20,908.61	98,205.54
-----	21,507.00	{ (6,440.00) E, F, G }	-----	6,110.00	3,445.00	10,705.00	70,662.00
3,587.41	13,115.00	{ (14,880.00) G, H }	2,345.90	3,999.10	L	3,105.00	54,177.05
3,675.00	26,912.27	{ (3,180.00) G }	1,300.00	1,887.50	1,887.50	6,760.00	57,902.27
15,000.00	20,000.00	{ (32,740.00) D, E, G, H }	6,000.00	7,000.00	2,500.00	5,000.00	116,565.00
10,756.82	21,855.22	{ (8,611.22) D, G, H }	2,097.75	10,333.18	L	4,794.30	90,321.02
-----	21,135.00	Not H. D.	3,300.00	3,715.00	2,868.00	1,434.00	38,162.00
38,110.00	-----	{ (35,449.00) G, H }	1,770.00	10,066.02	L	10,455.00	92,049.02
-----	29,395.00	D, G	6,776.59	3,610.00	11,175.00	5,845.78	100,399.18
-----	9,720.00	Not H. D.	7,720.00	7,340.00	11,320.00	13,320.00	89,584.94
3,877.03	-----	{ (19,385.66) D, E, G, H }	7,965.80	4,200.00	8,845.32	24,161.49	83,031.69
-----	8,500.00	{ (2,080.00) D }	3,000.00	3,600.00	3,400.00	8,200.00	43,000.00
21,703.15	-----	{ (19,373.52) D, E, F, G, H }	1,208.39	5,364.46	1,204.03	1,584.50	76,837.94
8,236.36	-----	{ (6,836.69) D, H }	2,494.00	7,163.06	L	5,249.20	31,474.47
26,557.67	-----	{ (32,020.00) D, G, H }	10,756.13	6,360.00	5,520.00	22,368.01	98,418.33
-----	5,760.00	{ (26,000.00) D, F, G }	4,460.00	2,300.00	3,900.00	9,000.00	67,970.00
21,547.17	31,025.00	{ (23,117.30) D, E, F, G, H }	4,519.57	6,315.10	L	6,804.91	124,992.78
34,040.00	-----	{ (34,025.00) D, E, F, G, H }	8,600.00	6,800.00	3,050.00	{ mo 8,100.00 }	99,765.00
20,735.00	-----	{ (20,070.00) D, E, F, G, H }	6,146.00	4,450.00	10,080.00	{ mo 17,565.00 }	95,276.00
-----	36,200.00	{ (21,751.00) D, E, F, G }	5,237.00	11,357.00	40,347.00	{ r 13,938.00 }	135,425.00
-----	10,450.00	Not H. D.	7,375.00	3,280.00	2,940.00	9,300.00	80,591.00
3,500.00	53,706.89	{ 29,186.00 3,120.00 (1,200.00) D }	8,609.48	4,284.00	16,200.00	M	115,460.37
-----	37,300.00	{ (7,800.00) D, G }	By State	1,800.00	L	10,871.48	78,079.02
24,858.52	-----	{ (24,587.16) D, G, H }	2,594.86	13,111.33	2,655.19	1,847.13	88,514.19

¹¹ Total is for 1923, specified items are 1925 budget.

¹² Total is for 1923, specified items are 1922 expenditures.

TABLE I.—Municipal expenditures for health service, 1923—Total reported *ex* expenditures by boards of education for school health

	Total expenditures of health department	Expenditures for specified items of health service					
		Adminis- tration	Vital statistics	Communi- cable disease	Tubercu- losis	Venereal disease	Maternal and infant hygiene
		A	C	D	E	F	G
Reading.....	pl 50,865.00	6,360.00	By State	5,895.00	State clinic	{ State clinic }	20,680.00
Richmond.....	p, pl, mo 112,234.00	12,514.00	A	12,204.00	12,570.00	3,803.00	14,692.00
St. Paul.....	h, c, mis 139,053.43	8,986.71	9,578.75	31,945.75	18,250.89	10,554.32	Not official
Salt Lake City...	h, p, c, mis 103,609.01	20,306.55	1,620.00	3,000.00	H	690.68	H
San Antonio.....	mis 63,509.63	4,680.00	2,100.00	6,960.15	1,380.00	10,603.16	1,380.00
Scranton.....	h, pl 36,384.31	5,799.92	By State	2,640.00	By State	{ State clinic }	Not by city
Spokane.....	h 66,471.79	5,534.04	1,673.00	5,312.81	Not by city	9,436.84	-----
Springfield.....	h 127,488.73	9,390.98	By State	1,672.49	4,537.00	{ State clinic }	Not by city
Syracuse.....	h, p, pl 177,845.61	19,353.75	4,500.00	7,700.00	5,785.00	9,712.50	7,290.00
Tacoma.....	h, pl, mis 47,072.51	5,905.00	A	1,680.00	-----	945.00	Not official
Trenton.....	pl 60,794.86	4,200.00	6,600.00	4,500.00	3,660.00	6,280.00	14,130.00
Tulsa.....	h, g, mis 98,075.00	9,925.00	By State	4,000.00	Not official	{ County clinic Not H. D. 3,650.00 }	Not official Not H. D. 10,250.00
Utica.....	pl 57,598.00	5,027.00	4,130.00	8,170.00	4,350.00	-----	-----
Wilmington.....	g 91,213.85	5,710.00	By State	9,065.85	{ State clinic Partly hospital 9,853.24 }	-----	By State
Worcester.....	h, g, pl 240,048.39	11,779.45	By State	2,879.37	-----	State clinic	{ 6,174.23 }
Yonkers.....	h, p, pl 187,593.75	12,499.18	3,070.00	6,308.33	12,055.92	8,398.33	17,411.64
Youngstown.....	g, pl, mis 66,294.77	5,325.87	1,600.00	2,012.50	{ Not official }	135.83	Not official
Total Group III	5,716,718.12	456,873.31	99,442.09	476,868.90	120,228.54	167,896.03	325,391.63
Allentown.....	g, h, c 49,660.00	4,157.86	By State	3,379.12	-----	488.20	2,126.57
Bayonne.....	pl 22,510.95	6,918.00	2,000.00	3,846.21	{ By county }	-----	20,300.00
Canton.....	32,182.46	8,321.00	A	8,430.00	-----	-----	-----
El Paso.....	h, mo, p 93,829.88	7,580.69	1,500.00	5,667.00	-----	3,713.96	5,523.49
Evansville.....	h, p 39,250.18	7,256.55	A	2,400.00	-----	2,993.50	{ Not H. D. 2,100.00 }
Fort Wayne.....	h 24,052.77	2,550.00	900.00	5,000.00	-----	3,000.00	-----
Harrisburg.....	h, pl 24,366.25	4,888.23	By State	9,412.11	D	-----	-----
Knoxville.....	h, p 18,551.55	3,380.00	960.00	5,020.00	D	4,845.00	-----
Lawrence.....	h, g, pl 372,296.80	8,209.71	480.00	9,925.38	3,559.10	3,710.98	8,077.47
Manchester.....	h 70,809.36	8,978.95	A	A, H, N	1,741.80	1,412.84	8,732.84
Peoria.....	h 23,233.42	1,200.00	1,059.00	2,872.52	Not H. D.	903.62	-----
St. Joseph.....	h 29,777.47	6,267.52	A	1,500.00	-----	-----	-----
San Diego.....	h, pl, mis 71,052.21	9,378.65	1,620.00	2,656.45	3,625.00	3,000.00	5,707.44
Savannah.....	mo, mis 89,151.42	23,102.28	1,400.00	5,440.77	D	2,380.00	J
Schenectady.....	h, p, pl, mis 66,250.06	6,716.00	4,050.00	2,125.00	3,175.00	2,200.00	15,117.00

penditures of health departments, expenditures for specified services, including service, with total for the services specified—Continued

Expenditures for specified items of health service							
School hygiene		Public-health nursing	Laboratory	Control of milk	Control of food	Sanitary inspection	Total for specified items
By health department	By board of education						
H	I	J	K	L	M	N	
	15,785.00	G	3,780.00	6,300.00	L, N	5,220.00	64,020.00
	24,820.64	{ (24,493.35) D, E, F, G }	10,111.00	9,349.00	8,279.00	{ i 16,342.00 }	124,684.64
	42,748.40	{ (12,360.00) D, E }	7,875.93	4,530.00	9,000.00	2,952.78	146,423.53
24,605.00	6,600.00	{ (29,212.07) E, F, G, H }	4,530.10	3,328.82	11,510.10	14,691.09	90,882.34
	10,802.50	{ 1,980.00 (3,840.00) D, E, G }	3,600.00	8,690.00	19,770.00	{ Not H. D. mo 23,261.32 }	95,207.13
	23,073.96	{ (2,640.00) D }	2,562.93	3,976.58	1,650.00	{ Not H. D. 3,780.00 }	43,483.39
	12,780.00	{ (2,874.00) F }	3,724.32	6,329.67	L	9,166.92	53,957.60
		{ (23,500.00) D, E, H }	L	8,947.61	1,500.00	14,507.94	71,550.21
30,994.19	35,249.22	{ (15,123.00) D, E, F, G, H }	15,010.50	8,558.00	7,707.50	2,500.00	128,756.47
5,390.00	11,684.89	F	2,425.00	2,177.00	5,638.00	2,065.00	32,519.89
11,800.00	30,720.00	{ (22,600.00) D, E, F, G, H }	1,000.00	2,150.00	11,920.00	M	96,960.00
	13,380.00	Not H. D.	5,100.00	5,250.00	N	6,300.00	43,955.00
	10,125.00	{ (6,740.00) D, E }	3,600.00	1,200.00	8,700.00	7,050.00	66,252.00
{ Not H. D. 1,600.00 }	9,027.10	Not H. D.	480.00	1,620.00	1,728.00	2,880.00	32,110.95
24,274.89		{ (22,526.75) D, E, G, H }	1,782.79	4,369.07	3,977.28	7,429.56	72,519.88
2,948.34	25,875.00	{ (29,040.00) D, E, F, G, H }	8,031.12	11,261.71	L	7,990.45	115,850.02
	20,085.71	Not official	1,246.07	M	7,050.76	16,442.86	53,899.60
415,852.18	786,746.23	{ (570,620.82) 50,192.73 }	244,142.14	290,065.25	293,015.97	451,277.92	4,177,992.92
	17,970.00	{ (4,000.00) D, G }	3,716.83	2,756.13	L	4,430.00	39,024.71
	22,326.06	{ (1,400.00) D }	By county	1,918.72	L	{ pl 5,458.21 }	62,767.20
	13,800.00	{ (4,700.00) D }	3,300.00	5,370.00	1,850.00	5,792.00	46,863.00
5,664.11	7,947.55	{ (10,163.49) D, G, H }	3,115.41	5,496.97	10,620.62	9,757.90	66,587.70
5,209.73		{ (6,373.33) D, H }	3,112.50	1,500.00	1,650.00	A	26,222.28
	7,100.00	{ (1,720.00) F }	1,800.00	2,000.00	1,560.00	8,400.00	32,310.00
150.00	6,071.19	{ (1,600.00) D }	120.04	1,847.25	2,257.75	1,826.86	26,573.43
	14,795.00	{ (3,200.00) F }	2,396.00	480.00	4,250.00	{ mo 3,300.00 }	39,426.00
20,392.07		{ (34,715.11) D, E, G, H }	900.00	3,549.75	3,927.30	2,299.96	65,031.72
14,468.05		{ (19,942.88) D, E, F, G, H }	1,139.97	2,520.66	2,727.18	{ r 3,672.37 }	45,394.66
	12,136.00	{ (1,480.00) D, F }	900.00	900.00	907.50	1,020.00	21,898.64
	16,096.50	Not H. D.	4,882.62	1,500.00	1,500.00	4,800.00	36,546.64
	20,550.00	{ (10,165.00) D, E, F, G }	2,513.26	5,260.00	2,260.00	{ mo, pl 7,619.19 }	64,189.99
	{ Not official }	9,366.89	9,746.28	1,440.00	9,282.00	10,492.64	72,650.86
G	37,965.00	{ (13,525.00) D, E, F, G }	8,000.00	4,312.00	1,500.00	2,810.00	87,970.00

TABLE I.—Municipal expenditures for health service, 1923—Total reported *ex* expenditures by boards of education for school health

	Total expenditures of health department	Expenditures for specified items of health service					
		Adminis- tration	Vital statistics	Communi- cable disease	Tubercu- losis	Venereal disease	Maternal and infant hygiene
		A	C	D	E	F	G
Sioux City-----	{ r 13,045.00	5,680.00	By State	1,500.00	D	{ Not by city State clinic	{ -----
Somerville-----	{ h 50,261.00	12,000.00	By State	5,750.00	3,000.00		{ 2,000.00
South Bend-----	{ pl 24,981.39	3,519.06	A	6,183.17	{ By county	{ 5,942.03	{ Not official
Troy-----	{ p, pl 35,000.00	10,500.00	2,100.00	4,200.00	1,400.00	1,400.00	1,400.00
Waterbury-----	{ g 85,504.00	5,977.00	By State	8,350.00	{ Not official	{ 2,200.00	{ 4,300.00
Wichita-----	{ h, g 60,780.98	7,811.60	By State	3,681.97	J	945.57	J
Wilkes-Barre-----	{ 20,818.00	9,138.00	By State	A, N	{ Not H. D. 1,800.00	E	E
Total Group IV	1,317,367.15	163,531.10	16,069.00	97,339.70	18,300.90	39,135.70	75,384.81
Total 100 cities.	28,413,998.70	1,926,830.99	491,801.50	2,632,484.12	1,273,770.56	472,925.88	1,698,557.68

penditures of health departments, expenditures for specified services, including service, with total for the services specified—Continued

Expenditures for specified items of health service							
School hygiene		Public-health nursing	Laboratory	Control of milk	Control of food	Sanitary inspection	Total for specified items
By health department	By board of education						
H	I						
	10,080.00	Not H. D.	1,700.00	N	N	4,140.00	23,100.00
7,000.00		{ (5,500.00) D, E, G, H }	600.00	5,350.00	2,200.00	1,600.00	39,500.00
	12,438.96	F	3,000.00	4,438.49	L	Not H. D.	35,521.71
	19,900.00	{ (9,000.00) D, E, F, G }	2,200.00	1,250.00	900.00	5,500.00	50,750.00
22,700.00		{ (21,000.00) D, F, G, H }	3,600.00	3,600.00	L	7,400.00	58,127.00
	9,702.00	{ Not H. D. 15,075.02 }	4,695.51	2,117.50	L	2,600.00	46,629.17
	19,794.07	Not H. D.	1,600.00	K	3,600.00	6,480.00	42,412.07
75,583.96	248,672.33	{ (148,484.81) 24,441.91 }	63,038.42	57,607.47	50,992.35	99,399.13	1,029,496.78
1,872,990.20	2,355,089.60	{ (3,365,954.86) 447,054.79 }	1,291,648.04	1,014,637.17	1,386,116.76	2,110,676.39	18,974,583.68

The expenditures for these services, however, even though they include expenditures by boards of education for school health services and by various other municipal agencies, in a few instances, for certain of the other specified services (indicated in Table I by the legend "Not H. D." accompanying the figure), totaled only about two-thirds of the total reported expenditures of the health departments. The balance, not summarized in this table, was made up largely of expenditures for the collection and disposal of garbage and for maintenance of hospitals. The reported expenditures for collection and disposal of garbage and refuse are not included in Table I for the reason that no clear-cut distinction was, apparently, made between expenditures for collection and for disposal of garbage and refuse and the figure given represents sometimes one, sometimes the other, and sometimes both of these items. It is impossible from the material at hand to separate these factors. The same general condition holds for the expenditures for hospitals. The variations are so great and the material intrinsically so unsatisfactory that it has seemed inadvisable to attempt to analyze it in this section. However, these items together with expenditures for minor or unusual activities are summarized in a later place.

The total expenditures by the health departments of the 100 surveyed cities for the year 1923 were \$28,413,998.70, or 88.4 cents per capita, for the 32,155,096 estimated total midyear (1923) population of these cities. The total expenditures for all municipal purposes by these cities for the year 1923 were \$1,588,142,292.70. Expenditures charged to health departments in that year, therefore, represent 1.78 per cent of the total expenditures. The expenditure by health departments represents also a tax rate of 6 cents per \$100, or six-tenths of 1 mill (\$.0006) per dollar for the surveyed cities.

Figures representing health department expenditures for the entire five-year period from 1919 to 1923, inclusive, are available for only 74 of the 100 cities. In the remaining 26 cities information regarding total expenditures for one or more years of the period was not obtained. In these 74 cities total annual expenditures in the five-year period increased from \$12,895,264 to \$18,189,798, or 41 per cent. Taking into account the estimated increase in population of these cities, the increase in per capita cost was 29 per cent. The expenditures for these 74 cities with the estimated population and the per capita expenditures by years are given in Table II.

TABLE II.—*Total and per capita expenditures of health departments by years, 1919–1923, inclusive, for 74 cities*

Year	Population	Expenditures	Per capita (cents)
1919.....	20,261,678	\$12,895,264	63.64
1920.....	20,735,249	15,385,931	74.18
1921.....	21,208,820	17,360,304	81.85
1922.....	21,682,391	17,527,122	80.84
1923.....	22,155,962	18,189,798	82.10

Turning again to the total expenditures in 1923 by the health departments of the 100 surveyed cities, as shown in Table III, we find a wide divergence of per capita cost in the different groups of cities. The per capita cost is highest (103.7 cents) for cities of Group II (250,000 to 500,000 population), and lowest (68.8 cents) for Group IV (70,000 to 100,000 population). The excessive cost shown in Group II is due in large measure to the fact that in Jersey City and Kansas City, Mo., very large general hospital expenditures are included in the health department appropriation, while in Seattle the items for hospital and garbage collection and disposal form a large part of the health department budget.

TABLE III.—*Total and per capita expenditures of health departments, 100 cities, for year 1923, grouped by size of city*

Group	Population	Expenditures	Per capita (cents)
Group I.....	17,340,168	\$15,584,047.37	89.9
Group II.....	5,589,138	5,795,866.06	103.7
Group III.....	7,310,265	5,716,718.12	78.2
Group IV.....	1,915,525	1,317,367.15	68.8
All cities.....	32,155,096	28,413,998.70	88.4

It is evident from what has already been said that the total reported expenditures of municipal health departments do not furnish a satisfactory basis for any study of the cost of the usual or standard program of activities or for comparative studies of any sort. The detailed tabulation of expenditures by specified functions given in Table I, however, affords a basis for a study of comparative expenditures which is reasonably satisfactory. The items of expenditures set forth in this table include all those forms of activity carried on by all or a large proportion of the surveyed cities and make up what may fairly be considered as a basic or standard budget of essential health service.

Examination of Table I, however, discloses that many cities list no municipal expenditures under one or another of the specified head-

ings. In some cases the reasons for this omission are given in the survey report and are set forth in the table. The table as given includes all the information obtainable from a careful review of the survey reports supplemented by a very considerable amount of direct correspondence. It is believed to be as nearly correct as the character of the financial reports of health departments in the surveyed cities makes possible.

TABLE IV.—*Total, per capita and percentage distribution of expenditures by municipal agencies for specified health services, 100 cities, for year 1923*.*
(Total population 32,155,096)

Item	Expenditures	Per capita (cents)	Per cent of total
Administrative.....	\$1,926,830.99	5.99	10.15
Vital statistics.....	491,801.50	1.53	2.59
Communicable disease ¹	2,632,484.12	8.19	13.87
Tuberculosis ¹	1,273,770.56	3.96	6.71
Venereal disease ¹	472,925.88	1.47	2.49
Maternal and child hygiene.....	1,698,557.68	5.28	8.95
School health service ²	4,228,079.80	13.15	22.28
Public health nursing ³	447,054.79	1.39	2.36
Laboratory.....	1,291,648.04	4.02	6.81
Control of milk.....	1,014,637.17	3.16	5.36
Control of other foods.....	1,386,116.76	4.31	7.30
Sanitary inspection ⁴	2,110,676.39	6.56	11.13
Total for specified items.....	18,974,583.68	59.01	100.00

* Expenditures for each item could not be completely segregated from all other items listed.
¹ Hospitalization excluded.
² Both health department and board of education.
³ Where not distributed among other items.
⁴ Expenditures for plumbing inspection, mosquito control, rodent control, housing inspection, and industrial hygiene have been excluded wherever they could be segregated, and this was possible in most, but not all, cities.

For the detailed items specified in Table I the 100 surveyed cities expended, in 1923, \$18,974,583.68. The distribution of these items, together with their per capita expenditure and the percentage distribution of expenditures, is given in Table IV, and the total per capita expenditure by each city for the specified services is shown in Figure 1. It should be understood, of course, that the per capita expenditures given in this table represent expenditures for the cities as a whole, taking no account of the fact that some cities list no expenditures in one or more of the specified items. Account must also be taken of the fact that in some cities expenditures for several functions are grouped under one heading. Wherever possible these have been allocated on the basis of the best information available. It is believed, however, that errors resulting from such failure to segregate expenditures by functions where such allocation was not possible, probably balance each other reasonably well and that the average per capita expenditures and percentage distributions for the 100 cities as given in Table IV are approximately correct.

In order to arrive at a reasonably accurate estimate of the actual per capita cost of any given service, however, it is necessary to limit

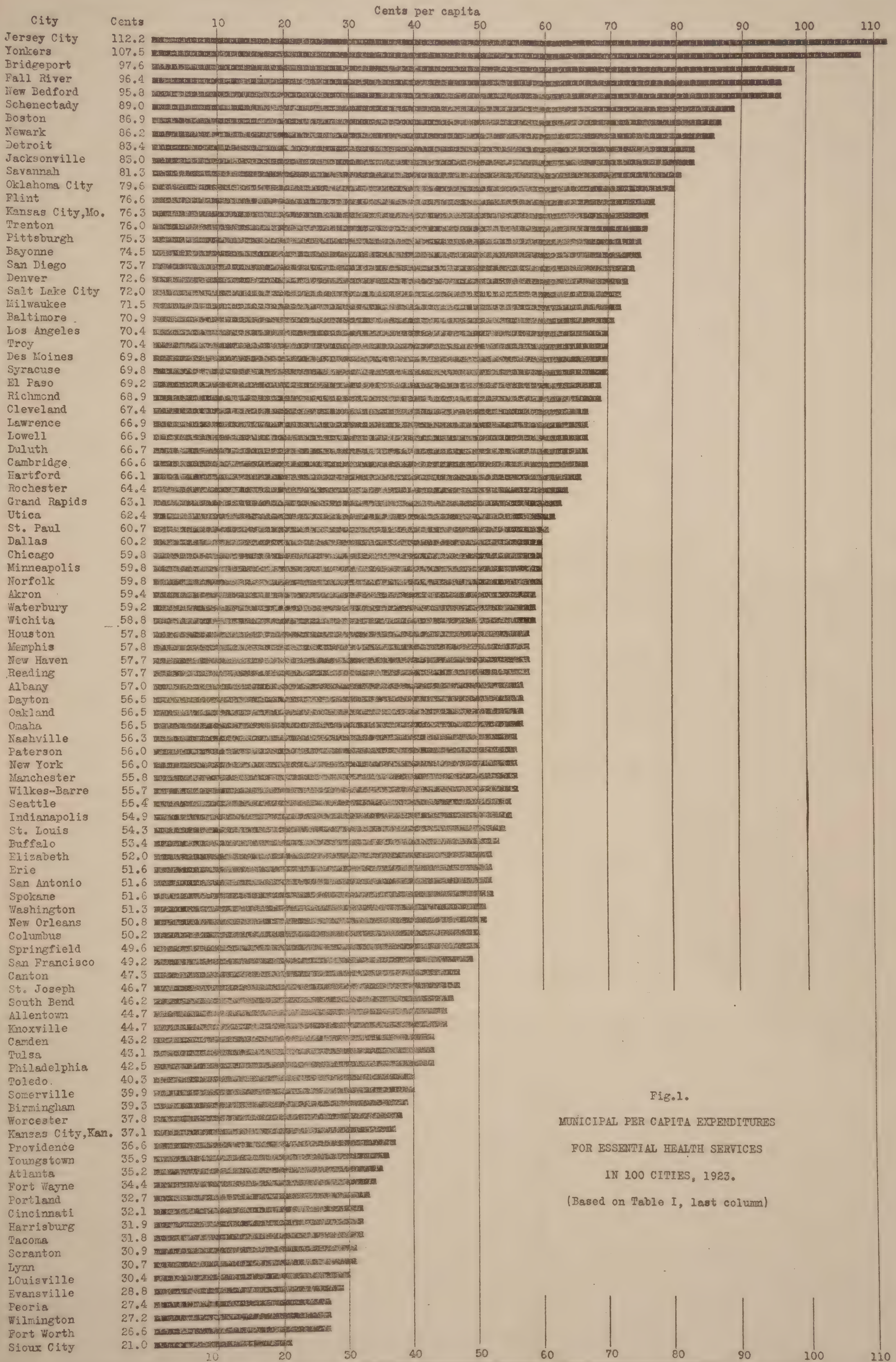


Fig.1.
MUNICIPAL PER CAPITA EXPENDITURES
FOR ESSENTIAL HEALTH SERVICES
IN 100 CITIES, 1923.
(Based on Table I, last column)

consideration to those cities in which the health department or some other municipal agency rendering health services usually performed by the health department, carries on all or at least a major part of the work in the field in question, and to those cities where the expenditure for any given service can be completely segregated from all others. A statement of per capita expenditures based, in the case of each function, on the expenditures and populations of those cities in which the function is performed by the municipality and the cost is segregated from other functions is given in Table V. Most of these expenditures are charged to the health department, but some are borne by the board of education, as is often the case with school hygiene, some by the municipal sanitary department, which in a few cities assumes the sanitary inspection work usually performed by the health department, while in still other cases the municipal sanatorium department is charged with the control of tuberculosis.

TABLE V.—Average municipal per capita expenditures for specified health service, in cents, 1923¹

Service	Group I	Group II	Group III	Group IV	All groups
Administration.....	5.7	5.8	6.2	8.5	6.0
Vital statistics.....	1.8	1.5	2.5	1.8	1.8
Communicable disease ⁴	8.4	7.8	6.2	5.4	7.4
Tuberculosis ⁴	9.7	3.0	3.6	3.1	7.3
Venereal disease ⁴	2.3	2.3	3.3	3.0	2.6
Maternal and child hygiene.....	5.5	4.6	7.0	6.7	5.7
School health service ²	10.8	14.1	16.9	16.5	13.0
Laboratory.....	4.4	3.9	3.5	3.5	4.1
Milk inspection.....	3.7	3.4	3.5	3.2	3.6
Food inspection.....	3.5	5.9	4.6	3.6	4.1
Sanitary inspection ³	4.5	8.0	6.3	5.5	5.7

¹ Includes under each service only those cities where expenditure for that service could be completely segregated from other services listed in this table.

² Both health department and board of education.

³ For only those cities where this item does not include expenditures for mosquito control, rodent control, plumbing inspection, housing inspection, or industrial hygiene.

⁴ Hospitalization excluded.

An examination of Table V reveals no very striking differences in per capita expenditures, for the functions given, as between cities of different size, except in the case of tuberculosis control. Expenditures for administration are somewhat greater, as would be expected, in the smaller cities. The same thing is true of expenditures for school health service, maternal and child hygiene, and for venereal disease control. The larger cities, on the other hand, report significantly greater per capita expenditures for communicable disease control, tuberculosis control, and for laboratory service than do the smaller cities. The relatively high expenditure for tuberculosis control in the largest cities, as compared with those of the other three groups, is largely accounted for by the more extensive participation in this work of municipal rather than voluntary agencies in the very largest cities. The relatively small expenditures for the

control of venereal disease and for maternal and infant hygiene as compared with the amounts spent for milk and food inspection and for general sanitation are perhaps the most striking features of this table.

TABLE VI.—Frequency distribution of total expenditures by municipalities for 12 essential health services in cents per capita, 1923. (100 cities)

	Number of cities having per capita expenditures (cents)																		
	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115
Group I.....	0	0	0	0	1	1	3	1	0	1	2	1	1	1	0	0	0	0	0
Group II.....	0	0	3	0	1	0	4	2	1	0	2	1	0	1	0	0	0	0	1
Group III.....	0	2	3	6	2	1	4	12	4	7	1	3	1	0	0	3	0	1	0
Group IV.....	1	2	2	1	1	4	0	4	0	2	3	0	1	1	0	0	0	0	0
All cities.....	1	4	8	7	5	6	11	19	5	10	8	5	3	3	0	3	0	1	1

The variations in per capita expenditures for each of the separate functions and for the total of the functions given are set forth in Table VI and Figure 2.

As will be seen from Table VI, five cities spent for all these services combined less than 30 cents per capita per annum, while two cities, at the other extreme, spent more than \$1. Almost one-third of the cities spent less than 50 cents per capita per annum for these services, about one-third spent between 50 and 65 cents, and about one-third spent more than 65 cents. Even between these broad limits the distribution is very scattering.

Still more striking is the widely scattered distribution of expenditures for the separate functions as given in Figure 2.

The most striking diversity is shown in connection with expenditures for school hygiene. For this function four cities spent 3 cents per capita per annum and four cities spent 32 cents or more per capita per annum. The distribution between these extremes is very irregular. The maximum number of cities in any classification is seven, at 13 cents per capita.

The range of expenditure for public health nursing, including all reported expenditures for that purpose, whether or not such expenditure is distributed in the reported expenditure for other functions, is very wide. The minimum per capita of cities reporting is 1 cent per annum and the maximum 34 cents per annum. The distribution between these limits is very scattering.

Expenditures for vital statistics and for milk inspection show the least variation, the maximum for vital statistics being 6 cents per capita per annum and for milk inspection 7 cents. The curves for these two items are reasonably smooth.

Expenditures for health administration tend to group between 4 and 6 cents per capita, although the upper limit is 25 cents.

Communicable-disease expenditures tend to group around 4 cents per capita with limits of 1 cent and 21 cents.

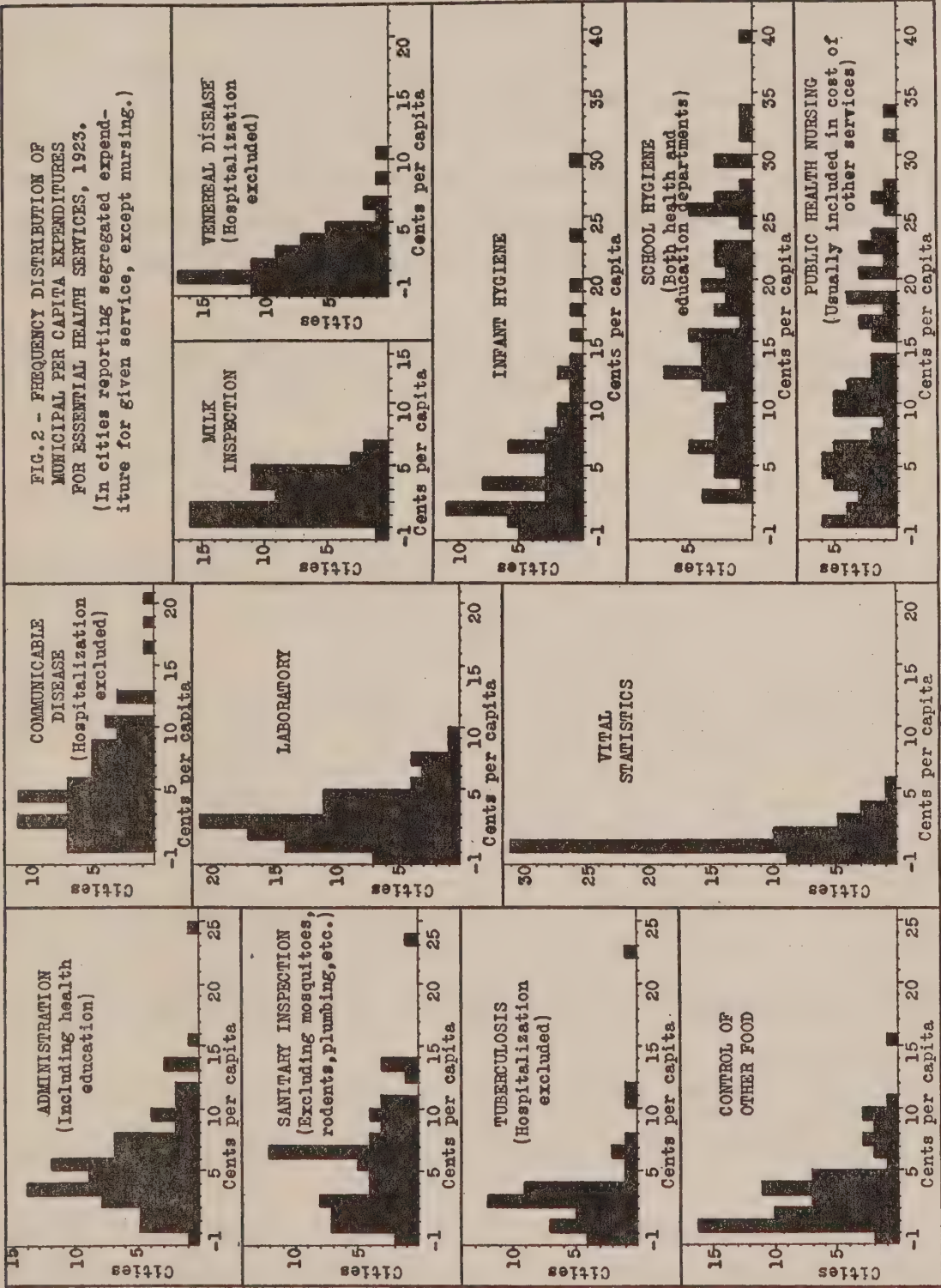


Fig. 2

The most frequent expenditure for venereal-disease control and food inspection is 1 cent per capita per annum; for tuberculosis, 3 cents per capita; for the laboratory, 3 cents per capita; and for sanitary inspection, 7 cents.

In general, the most striking feature of this chart is the absence from it of definite information as to what is the proper cost of some of the most frequent and essential activities of a health department.

Summarizing the information contained in the tables so far presented, there is given in Table VII a computation of the municipal cost of health service in cents per capita per annum based on the actual expenditures for 100 cities (totaling 59 cents per annum); the actual average for the cities reporting segregated expenditures for the specified services (totaling 62.7 cents per annum); the most usual expenditure for each service (totaling 46 cents per annum); and the maximum expenditure for each service by any city (totaling \$2.20 per annum).

TABLE VII.—*Per capita costs for essential health services by municipal agencies, 1923, computed in various ways in cents per capita per annum*

Service	Method of statement			
	Average actual cost for 100 cities ¹	Average actual cost for cities giving stated service ²	Modal or most usual cost ²	Maximum cost by any city ²
Administration.....	6.0	6.0	4.5	25.8
Vital statistics.....	1.5	1.8	1.5	6.9
Communicable disease ³	8.2	7.4	4.5	21.6
Tuberculosis ³	4.0	7.3	3.5	23.9
Venereal disease ³	1.5	2.6	1.5	11.5
Infant hygiene.....	5.3	5.7	2.5	30.9
School hygiene ⁴	13.1	13.0	13.5	40.3
Nursing ⁶	1.4	1.4	-----	-----
Laboratory.....	4.0	4.1	3.5	10.9
Milk inspection.....	3.2	3.6	2.0	7.2
Food inspection.....	4.3	4.1	1.5	16.8
Sanitary inspection.....	6.6	⁵ 5.7	⁵ 7.5	⁵ 24.2
Totals.....	59.0	62.7	⁷ 46.0	⁷ 220.0

¹ Expenditures for each service not completely segregated from other services.

² For only those cities where cost of given service is completely segregated from all other services except nursing.

³ Hospitalization excluded.

⁴ Both health department and board of education.

⁵ For only those cities where this item does not include expenditures for mosquito control, rodent control, plumbing inspection, housing inspection, or industrial hygiene.

⁶ Where not distributed in cost of other services (10 cities).

⁷ Total is simply sum of items listed and includes public health nursing where latter is distributed in cost of other services.

In addition to the expenditures given in Table I the health departments and, in a few instances, other municipal departments of the surveyed cities, reported in certain cases expenditures for other functions of direct or indirect bearing on the public health. These occur principally in connection with mental hygiene, industrial hygiene, mosquito eradication or rodent control.

The only considerable amount reported as spent for mental hygiene was in Denver, where the school board was stated to have expended \$28,700 for that purpose.

The reported expenditures for industrial hygiene total \$83,825.29. Of this the largest part was reported by New York (\$77,051.89), and in addition Louisville reported an expenditure of \$650, San Francisco \$623.40, while in Washington, D. C., it was stated that of the total amount given in Table I as expended for general sanitation, \$5,500 was devoted to industrial hygiene work. Three other cities (Los Angeles, Newark, Richmond) reported that of the amount given in Table I under sanitary inspection a certain proportion was used for industrial hygiene.

Quite a number of cities conducted mosquito-control work, some of which reported the amount spent for this work, while for others the expenditure (not stated) is included under sanitary inspection in Table I. These cities are shown in Table VIII.

TABLE VIII.—*Municipal expenditures for mosquito control, 1923*

City	Expenditure	Per capita (cents)	City	Expenditure	Per capita (cents)
Atlanta ¹	\$4,551.43	2.0	New Orleans	(²)	-----
Baltimore ¹	25,000.00	3.2	New York	\$52,500.00	0.9
Boston	(²)	-----	Norfolk (1924)	(²)	-----
Dallas	4,927.00	2.7	Oakland	600.00	.3
El Paso	19,430.91	20.2	Providence	25,775.75	10.7
Houston (1925)	6,076.50	3.9	Richmond	200.00	.1
Jacksonville	11,189.73	11.2	St. Louis	5,150.00	.6
Knoxville (1924)	(²)	-----	San Antonio ¹	(²)	-----
Louisville	2,475.62	1.0	San Diego	(²)	-----
Memphis	6,043.83	3.6	Savannah	14,075.80	15.7
New Haven (1924)	(²)	-----			

¹ Not charged to health department.

² Not segregated. Included under sanitary inspection in Table I.

The control of rodents was reported as a municipal function in a number of cities. As in the case of mosquito control, some of these gave the expenditure while for others it was not segregated, but is included under sanitary inspection in Table I. These cities are shown in Table IX.

TABLE IX.—*Municipal expenditures for rodent control, 1923*

City	Expenditure	Per capita (cents)	City	Expenditure	Per capita (cents)
Boston	\$2,920.00	0.4	New York	(³)	-----
Flint ¹	3,575.00	3.0	Oakland	(³)	-----
Hartford	411.00	0.3	Portland	(³)	-----
Los Angeles	2,000.00	0.3	Providence	\$3,026.93	1.2
Manchester	(³)	-----	St. Louis	(³)	-----
New Bedford ²	5,951.65	4.6	San Francisco	2,622.77	0.5
New Orleans	18,675.56	4.6	Seattle	7,600.00	2.4

¹ Not charged to health department, but under its supervision.

² Special work, not charged to health department.

³ Not segregated. Included under sanitary inspection in Table I.

Since many health departments are charged with expenditures for other services than those already discussed, it is considered advisable to present those that have been reported for purpose of record. Health department expenditures for hospitals are given in Table X, for garbage disposal in Table XI, for plumbing inspection in Table XII, for housing inspection in Table XIII, for medical relief to poor in Table XIV, and for other miscellaneous activities in Table XV. None of the expenditures shown in these tables has been included under the cost of the specified services previously analyzed.

TABLE X.—*Health department expenditures for hospitals, 1923*.*

City	Expenditure	Per capita (cents)	City	Expenditure	Per capita (cents)
Akron.....	^a \$13,100.00	6.3	New York.....	^{a, c} \$1,760,473.68	29.7
Albany (1924)	^b 2,240.00	1.9	Norfolk (1924)	^a 9,401.60	5.9
Atlanta.....	13,031.28	5.9	Oklahoma City.....	^a 11,170.00	11.0
Baltimore.....	47,442.44	6.1	Omaha (1922).....	^{a, b} 16,879.63	8.2
Boston.....	^a 15,964.72	2.1	Paterson.....	^{a, b, c} 53,124.59	38.0
Bridgeport.....	^a 64,029.00	44.6	Peoria.....	^{a, b} 14,928.52	18.7
Cambridge.....	^c 51,888.19	46.7	Pittsburgh.....	^c 103,755.66	16.7
Camden (1924)	52,000.00	41.8		^d 104,161.73	16.8
Chicago (1922).....	^{a, b} 325,641.94	11.2		^a 14,876.47	5.4
Columbus.....	10,706.87	4.1	Portland.....	^e 12,680.00	4.6
Dallas.....	^e 21,100.00	11.6	Rochester.....	^{a, b} 41,527.87	13.1
Denver.....	^a 18,480.00	6.8	St. Joseph.....	^a 7,690.59	9.8
Des Moines.....	^b 696.00	.5		^b 1,636.74	2.1
Detroit.....	^a 461,766.00	46.3	St. Paul.....	^b 6,193.90	2.6
	^c 416,000.00	41.7	Salt Lake City.....	^b 7,534.67	6.0
Duluth (1924)	^{a, b} 24,980.00	23.6	San Diego.....	^{a, b} 17,976.33	20.7
Elizabeth.....	^a 15,008.59	14.4		^d 9,069.31	10.4
El Paso.....	¹ 10,062.76	10.5		^a 28,335.00	5.3
	^a 4,043.08	4.2		^{a, b} 68,261.40	12.6
Erie.....	^a 7,950.00	7.1	San Francisco.....	^c 253,987.00	47.1
Evansville.....	^b 3,214.16	3.5		^d 411,444.92	76.2
Fall River.....	³ 36,000.00	29.8		^e 150,240.73	27.8
Grand Rapids.....	^a 13,450.00	9.2	Schenectady.....	^a 6,405.56	6.5
	^c 102,460.00	70.0	Scranton.....	^{a, b} 17,341.11	12.3
Hartford.....	^a 72,631.90	47.8	Seattle.....	^c 171,112.05	54.2
Indianapolis (1924)	^d 373,024.96	108.7		^d 103,787.29	32.8
	^a 36,105.00	11.6	Somerville.....	^{a, b} 18,000.00	18.2
Jersey City.....	^d 589,154.70	190.5	Spokane.....	^{a, b} 19,856.28	19.0
Kansas City, Mo.....	^{a, c} 748,573.16	213.0		^e 5,437.91	5.2
Knoxville (1924)	^b 5,674.00	6.4	Springfield.....	^{a, c, d} 53,170.33	36.8
Lawrence.....	^e 49,543.15	50.9	Syracuse.....	^{a, b} 43,865.00	23.8
Los Angeles.....	^a 11,013.74	1.6		² 7,772.50	4.2
Lowell.....	^c 49,555.70	43.1	Tacoma.....	^{a, b} 14,245.00	14.0
Lynn.....	^{a, b} 33,440.75	32.6		^a 16,998.09	6.3
Manchester.....	^c 55,628.28	54.2	Toledo (1922).....	^d 42,246.35	15.7
Milwaukee.....	^a 25,565.03	31.3	Tulsa.....	^a 3,850.00	3.8
	^a 90,141.44	18.6	Wichita.....	^{a, b} 1,627.22	2.1
New Bedford.....	^{a, b} 15,836.39	12.1	Worcester.....	^{a, c, d} 154,311.48	80.4
	³ 80,242.52	61.4	Yonkers.....	^a 38,831.85	36.1
New Orleans.....	^a 19,673.49	4.8		^c 41,150.00	38.3

* In a number of these and other cities additional hospital facilities of a similar nature were provided through municipal funds which were not charged to the health departments. Such facilities consisted largely of (1) city general hospitals, in some of which communicable disease, venereal disease or tuberculosis wards were provided, (2) city tuberculosis hospitals or camps, and (3) city appropriations for care of patients in county or other hospitals. For example, the Boston Sanatorium Department spent \$297,769.04, and the Tuberculosis Sanatorium in Chicago spent \$720,309.62.

^a Communicable disease hospital.

^b Smallpox hospital.

^c Tuberculosis hospital.

^d City general hospital.

^e Emergency hospital.

¹ Contribution to county hospital.

² Psychopathic hospital.

³ For care of patients at tuberculosis sanatorium

⁴ Venereal disease hospital.

TABLE XI.—*Health department expenditures for garbage disposal, 1923*

City	Expenditure	Per capita (cents)	City	Expenditure	Per capita (cents)
Albany (1924).....	\$30,225.00	25.8	Providence.....	\$90,933.34	37.5
Allentown.....	22,732.90	26.1	San Francisco.....	¹ 3,701.20	0.7
Bridgeport.....	174,871.00	121.5	Seattle.....	477,010.93	151.0
Duluth (1924).....	17,355.00	16.4	Tulsa.....	40,000.00	39.2
Kansas City, Mo.....	136,400.00	38.8	Waterbury.....	27,383.00	27.8
Lawrence.....	255,805.27	262.5	Wichita.....	35,304.42	44.6
Lowell.....	47,562.66	41.3	Wilmington.....	69,730.00	59.3
Oklahoma City.....	66,875.00	66.3	Worcester.....	² 5,589.50	2.9
Omaha (1922).....	82,821.82	40.5	Youngstown.....	24,382.63	16.2
Pittsburgh.....	1,377,000.00	222.0			

¹ For inspection only. Collection is by private scavengers.² For refuse incinerator only.TABLE XII.—*Health department expenditures for plumbing inspection, 1923*

City	Expenditure	Per capita (cents)	City	Expenditure	Per capita (cents)
Albany (1924).....	\$4,320.00	3.7	Paterson.....	\$4,848.52	3.5
Atlanta.....	8,400.00	3.8	Philadelphia.....	32,415.45	1.7
Baltimore.....	(¹)	-----	Pittsburgh.....	37,181.00	6.0
Bayonne.....	(¹)	-----	Reading.....	4,280.00	3.9
Buffalo.....	27,663.82	5.1	Richmond.....	4,670.00	2.6
Chicago (1922).....	44,953.80	1.6	Rochester.....	11,725.29	3.7
Elizabeth.....	3,374.36	3.2	San Diego.....	(¹)	-----
Erie.....	6,255.00	5.6	San Francisco.....	12,338.85	2.3
Fall River.....	2,000.00	1.7	Schenectady.....	2,675.00	2.7
Flint.....	8,392.57	7.1	Seranton.....	2,413.77	1.7
Grand Rapids.....	5,219.20	3.6	Seattle.....	7,160.00	2.3
Harrisburg.....	3,864.41	4.7	South Bend.....	2,000.00	2.6
Indianapolis (1924).....	4,800.00	1.4	Syracuse.....	4,185.00	2.3
Jersey City.....	20,000.00	6.5	Tacoma.....	3,965.00	3.9
Lawrence.....	1,916.66	2.0	Trenton.....	2,700.00	2.1
Lowell.....	4,504.08	3.9	Troy.....	3,000.00	4.2
Lynn.....	1,932.08	1.9	Utica.....	3,810.00	3.6
Newark.....	14,100.00	3.2	Washington.....	19,060.00	4.0
New Bedford.....	5,200.00	4.0	Worcester.....	7,627.53	4.0
Oakland.....	10,290.00	4.3	Yonkers.....	7,196.08	6.7
Omaha (1922).....	1,800.00	0.9	Youngstown.....	5,093.75	3.4

¹ Not segregated. Included under sanitary inspection in Table I.TABLE XIII.—*Health department expenditures for housing inspection, 1923*

City	Expenditure	Per capita (cents)	City	Expenditure	Per capita (cents)
Buffalo.....	\$42,879.00	8.0	Pittsburgh.....	(¹)	-----
Chicago (1922).....	44,953.00	1.6	Portland.....	(¹)	-----
Louisville.....	1,200.00	0.5	St. Louis.....	(¹)	-----
Omaha (1922).....	1,620.00	0.8	San Francisco.....	\$4,183.80	0.8
Philadelphia.....	24,684.75	1.3			

¹ Not segregated. Included under sanitary inspection in Table I.

MUNICIPAL HEALTH DEPARTMENT PRACTICE

TABLE XIV.—*Health department expenditures for medical poor relief, 1923*

City	Expenditure	Per capita (cents)	City	Expenditure	Per capita (cents)
Albany (1924)-----	\$4,750.00	4.0	Memphis-----	² \$2,500.00	1.5
Atlanta-----	4,620.00	2.1	Nashville-----	¹ 5,000.00	4.1
Cambridge-----	22,778.49	20.4	Newark-----	26,938.49	6.1
Cincinnati-----	4,154.00	1.0	Norfolk (1924)-----	49,877.00	31.3
Columbus-----	6,480.00	2.5	Providence-----	4,256.00	1.8
Denver-----	3,480.00	1.3	Richmond-----	7,500.00	4.1
El Paso-----	1,652.45	1.7	Salt Lake City-----	³ 4,498.84	3.6
Evansville-----	11,913.74	13.1	San Francisco-----	⁴ 359,132.16	66.6
Houston (1925)-----	10,280.00	6.6	Schenectady-----	2,800.00	2.8
Indianapolis (1924)-----	12,219.99	3.6	Syracuse-----	13,970.00	7.6
Jacksonville-----	¹ 11,920.25	11.9	Troy-----	2,800.00	3.9
Kansas City, Mo.-----	15,161.56	4.3	Yonkers-----	5,318.00	4.9
Louisville-----	4,108.62	1.6			

¹ Dispensary.² Gift to Associated Charities, now discontinued.³ Community clinic.⁴ Including Relief Home.TABLE XV.—*Health department expenditures for miscellaneous activities, 1923*

City	Expenditure	Per capita (cents)	Purpose
Allentown-----	\$5,872.96	6.7	Comfort stations.
Atlanta-----	6,053.88	2.7	Not specified.
Boston-----	{ 18,839.89	2.4	Health unit, largely preschool.
Buffalo-----	{ 42,307.12	5.5	Comfort stations.
Camden (1924)-----	22,701.84	4.2	Public baths.
	1,700.00	1.4	Related family problems.
Chicago-----	{ 96,420.82	3.3	Public baths.
	26,444.68	.9	Water supply and typhoid control.
	11,250.35	.4	Comfort stations.
Cleveland (1924)-----	18,000.00	2.0	Night soil disposal.
Duluth (1924)-----	5,435.00	5.1	Cattle inspection.
Elizabeth-----	2,400.00	2.3	Dog catcher.
Jacksonville-----	4,028.20	4.0	Keeper of cemetery, etc.
Memphis-----	3,973.04	2.3	Division of sanitary engineering.
Minneapolis-----	5,999.17	1.5	Auto purchase and maintenance.
Oakland-----	4,528.00	1.9	Medical and nursing care. ¹
Omaha (1922)-----	2,563.85	1.3	Not specified.
Pittsburgh-----	15,197.52	2.4	Bureau of smoke regulation.
Rochester-----	{ 2,816.11	.9	To city garage.
	3,000.00	.9	Outstanding bills.
	19,660.95	8.1	Public baths.
St. Paul-----	{ 6,011.56	2.5	Comfort stations.
	2,611.89	1.1	Dog catcher.
Salt Lake City-----	{ 3,829.35	3.0	Weights and measures.
	3,463.81	2.7	Comfort stations.
San Antonio-----	1,685.00	.9	Barber shop inspection.
San Diego-----	256.68	.3	Furniture and fixtures.
Savannah-----	2,426.06	2.7	Not specified.
Schenectady-----	4,360.50	4.4	Chauffeur, pensions, etc.
Tacoma-----	1,920.00	1.9	Watershed patrol.
Tulsa-----	{ 19,000.00	18.6	Auto purchase and maintenance.
	4,650.00	4.6	Not specified.
Wichita-----	1,977.19	2.5	Weed cutting.
Youngstown-----	3,004.51	2.0	Salaries, other employees.

¹ Of city employees and prisoners.

II. EDUCATIONAL PROBLEMS

HARRY H. MOORE,

United States Public Health Service

A. Public Health Training

Since the conference on the education of sanitarians, held in March, 1922, at Washington, increasing attention has been given by health agencies and universities to the training of sanitarians now employed, and to the student, who must be relied upon in large measure for the public health work of the future. It was pointed out at this meeting that only 17 per cent of the executives of 72 of the largest municipal health departments in America had had academic training in public health work. While obviously the majority of these have compensated in large measure for this lack of technical, academic training by a career of rich experience, there are a much larger number in minor positions whose usefulness and progress in public health work will depend upon the availability of systematic academic training and their ability and opportunity to take advantage of it.

Educational opportunities for the man now employed include: (1) The annual conferences of local health officers conducted by State departments of health, (2) short-term institutes organized by State and national health agencies, (3) correspondence courses offered both by State departments of health and universities, and (4) short terms of work in universities, usually a six weeks' summer school. For the student preparing himself for a career in the field of public health, there are now approximately 14 institutions with departments or curricula on public health subjects.

Municipal health departments are now participating in the two types of work—instruction for those employed and for those who are in training for the future.

PUBLIC HEALTH TRAINING FOR HEALTH DEPARTMENT EMPLOYEES

Health departments in 1924 reported training facilities for minor employees in general in eight cities. Chicago had a "School of Sanitary Instruction," and certain courses and an examination were required of all probationary employees. Boston gave weekly lectures at which the attendance of employees was expected unless work

interfered. Memphis conducted a series of 12 weekly lectures. Similar facilities appear to have been offered by the Detroit, Indianapolis, Newark, Savannah, and Utica health departments.

Special work for nurses was offered in six cities. In Milwaukee and Flint there was a series of weekly lectures given by staff members or by outside physicians. In New York courses in industrial hygiene were given for nurses. Lectures were provided by the El Paso, Dallas, and Dayton departments.

Universities and other outside agencies offered training facilities in a few cities, and attendance was encouraged or required by the health department. Several employees of the Minneapolis health department attended lectures twice a month at the University of Minnesota. This work, however, was not compulsory. Inspectors of the Philadelphia department were required to attend lectures at the University of Pennsylvania.

Special work for nurses was provided by universities and other agencies in six cities. The Fall River department offered a three-day course for nurses conducted by the State. In Nashville training was provided both by the "Council of Public Health Nurses" and by Peabody College. The University of California offered a course at Berkeley attended by nurses employed by the San Francisco department. The nurses of the Cambridge department were given the opportunity and urged to attend lectures in Boston. A very popular course in psychiatry offered by the extension department of Brown University was attended by many nurses employed by the Providence health department. In Elizabeth instruction was given at intervals by the State department of health, and supervising nurses were sent to New York for special training. In New Jersey cities there is a special need for public-health training due to a strict law prohibiting local boards of health from appointing health officers and sanitary inspectors who are not licensed by the State department of health. Examinations have been conducted during the past 20 years, resulting in the licensing by the State department of health ¹ of more than 200 health officers and 700 inspectors.

Incidentally it may be mentioned here that health departments occasionally assisted also in the public-health training of persons engaged in health and medical work outside of the department. Lectures were conducted for midwives in two cities, Bayonne and New Orleans, and for physicians in Erie, Jersey City, Dallas, Nashville, and El Paso. Public-school teachers play an important part in the health training of children, and it should also be noted, therefore, that 20 municipalities report courses or single lectures for this group.

¹ To meet the need for public-health training in New Jersey it may be mentioned incidentally that in the summer of 1925 the State department of health entered into an arrangement with Rutgers College to provide a program of lectures for health officers and public-health nurses. These were offered on Friday and Saturday for a series of weeks.

PUBLIC-HEALTH TRAINING FOR STUDENTS

Municipal health departments participated in the training of public-health nurses in 18 of the cities reporting, the executive health officer conducting the courses in most instances. In Allentown a course of 20 lectures was given by the health officer to the nurses of three hospitals. In Toledo pupil nurses at the hospitals were given public-health training in the field. The Yonkers department conducted a course at the Health Department Hospital for nurses of various local hospitals. Undergraduate nurses in the contagious-disease hospital maintained by the Somerville Board of Health are given instruction by the Matron and the executive officer of the board. In Denver a series of lectures was offered to the employees of the visiting nurses association. Similar courses were conducted in Buffalo, Milwaukee, Harrisburg, Houston, Jersey City, and Sioux City. In addition to these courses, some kind of instruction was given to audiences of nurses in Dallas, Des Moines, Indianapolis, Oklahoma City, San Francisco, New Haven and Utica.

Public-health training for medical students appears to have been provided by municipal health department executives in three instances. In Denver the health officer gave a course in public health to the medical students of the University of Colorado and similar lectures were given in Baltimore and New Haven.

Brown University utilizes the Providence Department of Health in the instruction of both graduate and undergraduate students.

RECOMMENDATIONS

The problem of training sanitarians for the future is an important one, and health department executives should stand ready to assist in this work by lecturing when called upon and by offering to universities and colleges the facilities of the department for practical training. The problem is not a responsibility of local health departments, however. For this reason recommendations here will be confined to that phase of public training for which the municipal health agency is definitely accountable, i. e., the training of sanitarians now employed.

The man on the job who needs more training constitutes, it was emphasized at the conference on the education of sanitarians, not merely a very pressing need of to-day, but a need which will continue. No man, it was stated, who is worth his salt and who has obtained a job, will ever feel satisfied with his academic training, no matter where he obtained it. Furthermore, if public health employees in the future are licensed, a system of examinations necessarily will be adopted, which will create a very definite demand for academic training.

The training of sanitarians now employed is of such importance as to require the careful attention of municipal health department executives. Obviously, the officer charged with the development of popular health education will not necessarily be equipped to deal with this new phase of the work. He should be primarily one who is familiar with academic organization, particularly with the facilities offered by the universities of the country during both the regular school year and summer session. Inasmuch as it will be desirable for him to deal with many bureau heads as well as with minor employees in regard to the problem of supplemental academic instruction, the person assigned to this responsibility should have the status at least of a bureau chief. In some instances it will seem wise for the health department executive himself to give this subject special attention.

Systematic provision must be made for some supplemental training for all employees who are to remain with the health department, especially those who hope to advance to positions of responsibility. Furthermore, many executives should plan their work so that they themselves may have the advantage of such training. It is not necessary that the department should conduct public-health courses, and indeed in many instances it is not wise that they should. In some cities public-health schools or departments of universities provide courses superior to any which may be organized by the department of health. In all large city health departments it should be possible to grant to at least a few employees each year leaves of absence to attend one or more courses. Columbia University and the University of Michigan, in 1925, offered approximately 90 public-health courses each during their summer session, and some 8 or 10 other institutions gave from 5 to 20 courses each. At least one university, Columbia, will offer short courses of two and three weeks' duration in connection with the 1926 summer session. At the Harvard School of Public Health, courses are now given which continue only one month during the regular school year, but for the reason that they occupy an entire day or half-day, thorough training may be secured in the special subjects offered.

A list of schools and departments of public health, also a list of a few institutions offering public-health courses during the summer session of 1925 may be found on the opposite page. Ample facilities now make it possible for all health-department employees to obtain the kind of training which will enable them to become more efficient, provided only that the health-department executive is able and disposed to make the necessary arrangements.

The short-term institute and the annual conference of local health officers are of limited value, as is also the correspondence course if the student is sufficiently persistent, and they should all be utilized.

But none of these measures will take the place of the systematic, personal, stimulating instruction now available in the form of short-term courses at various universities throughout the country.

SCHOOLS AND DEPARTMENTS OF PUBLIC HEALTH, HYGIENE, AND PREVENTIVE MEDICINE

Columbia University, the Institute of Public Health, New York, N. Y.

Harvard University, School of Public Health, Boston, Mass.

Howard University, School of Public Health and Hygiene, Washington, D. C., (colored)

Johns Hopkins University, School of Hygiene and Public Health, Baltimore, Md.

Massachusetts Institute of Technology, Department of Biology and Public Health, Boston, Mass.

New York University, Public Health Courses, New York City.

Ohio State University, Department of Public Health and Sanitation, Columbus, Ohio.

University of California, Department of Hygiene, Berkeley, Calif.

University of Chicago, Department of Hygiene and Bacteriology (Rush Medical College), Chicago, Ill.

University of Michigan, Department of Hygiene and Public Health, Ann Arbor, Mich.

University of Minnesota, Department of Preventive Medicine and Public Health, Minneapolis, Minn.

University of Pennsylvania, School of Hygiene and Public Health, Philadelphia, Pa.

Washington University, Department of Hygiene and Public Health (School of Medicine), St. Louis, Mo.

Western Reserve University, Department of Hygiene and Bacteriology, Cleveland, Ohio.

Yale University, Department of Bacteriology, Pathology, and Public Health, New Haven, Conn.

A FEW OF THE INSTITUTIONS OFFERING PUBLIC HEALTH COURSES DURING THE SUMMER SESSION OF 1925.

Columbia University, New York	University of Utah, Salt Lake City
University of Michigan, Ann Arbor	Utah Agricultural College, Logan
University of Colorado, Boulder	Massachusetts Institute of Technology
University of Minnesota, Minneapolis	Cambridge
University of Iowa, Iowa City	University of Oregon, Eugene
University of California, Berkeley	Lehigh University, Bethlehem, Pa.

B. Popular Health Education

Hermann M. Biggs in 1922 made the following statement at a conference in Washington: "It seems to me that we have accomplished almost everything by propaganda * * *. The death rate in New York City from preventable diseases has been reduced 50 per cent. This has been by the education, not of the highest class, but of the lowest class * * *. First we educate the tenement-house population and teach the children. They will teach their parents. The

parents in turn teach the medical profession. You can teach the mass of the people and they will teach the leaders."

To an increasing degree it is being realized that in the future the prevention of disease must be brought about largely by popular health education. The importance of educational work in the control of tuberculosis, diphtheria, smallpox, malaria, the venereal diseases, and other disorders has long been appreciated. Now it appears that other diseases must be attacked through education. Said Robert H. Halsey, secretary of the American Heart Association, in 1924, in discussing the control of heart disease, "The best means that may be employed to diminish these serious losses is wider dissemination of the knowledge of the seriousness of rheumatism, tonsillitis, syphilis, and other infectious disease in relation to the heart." George Newman, chief medical officer of the British Ministry of Health, enumerates the following "10 types of ill-condition or disease" which, for their remedy, demand personal hygiene based upon health education: (1) General insanitary conditions, (2) diseases of the respiratory tract, (3) digestive disturbances, (4) dental decay, (5) the commoner infectious diseases, (6) maternal sickness, (7) infant sickness, (8) rickets, (9) cancer, (10) nervous and mental troubles. The control of these disorders, he maintains, can not be brought about merely by the enforcement of sanitary measures. The cooperation of an educated people is necessary.

The position of popular health education in modern health work may well be kept in mind in considering the activities of municipal health departments.

The analysis that follows is based upon conditions in 1923.

ORGANIZATION AND EXPENDITURES

In only one of the 100 cities surveyed, namely, Buffalo, did the department of health have a separate bureau or division in charge of popular health education. In the large majority of cases, the work was done more or less incidentally by the chief executive officer of the department with the aid of bureau heads, clerks and stenographers. In three cities the department of health appears to have given no attention whatsoever to popular health education, and in some 10 or more other cities, activities were limited to an occasional lecture or press notice.

The amount of money spent for supervision may perhaps be used as an index of the quantity of work done. New York City appropriated for health education over \$16,000, including part of the salary of a medical director. Syracuse charged \$5,200 of its total budget to health education; Detroit, \$4,000; Newark, \$3,000; Buffalo, \$2,600; Lynn, \$2,500; and Wilmington, \$1,300; while in Manchester

only \$156, and in St. Louis only \$300 was appropriated for this purpose. Chicago expended \$3,600 for minor employees devoting their time to health education. Amounts were given in only these ten instances. In the other 90 cities, expenditures for health education would probably have been reported if more accurate accounting obtained.

Only 31 cities reported expenditures for purposes other than supervision. Chicago appropriated the largest amount for printing, namely, \$38,000. New York expended \$16,000 for this purpose and Syracuse \$6,000. Only eight cities reported expenditures—and these are small—not included under the heading of printing.

ACTIVITIES

Newspaper articles, lectures, pamphlets, bulletins, and exhibits appear to be the most effective media of popular health education used by municipal health departments. A brief summary of activities in these five fields follows:

Newspaper education.—In 80 cities the newspapers are more or less systematically used for the education of the people, and in 20 cities never or rarely. Of the 80 municipalities, 3 reported 500 to 700 press notices per year; 6 cities, 300 to 365; 17 cities, 75 to 300; and 22 cities, 35 to 75 per year. The 32 other cities prepared material less frequently or they replied to the question in general terms.

The survey made no specific reference to daily health talks. Boston, however, reported that the "department is furnishing daily articles on health topics to the Boston American." No reference appeared regarding the utilization of syndicated health talks.

One city, Jacksonville, reported the use of a full page advertisement on mosquito control. It was paid for by a local bank.

In only three instances does it appear that a special amount in the health department budget was appropriated for newspaper work.

Lectures.—In 77 cities the health department reported the use of lectures, 17 of these giving 100 or more each during the year.

New York heads the list with a record of 3,788, Buffalo next with 2,500; Chicago, 407; and Lawrence and Philadelphia, 200 each.

Eleven cities reported 50 to 100 lectures each during the year, and 50 cities had less than 50.

The attendance at lectures was not recorded in one-half of the 77 cities. In the others the average attendance varied in most instances from 20 to 200. In a very few cases there were extremes not included within these limits.

Virtually all subjects of popular interest in the public health field appear to have been treated by health lecturers, with child hygiene in its various aspects appearing more frequently than

others. Women's clubs, churches, associations of teachers and parents, schools, lodges, and organizations of social workers were among the groups most often reached. In Spokane one or more lectures were given to milk dealers.

The stereopticon was used more or less frequently by 32 departments, and motion pictures by 29. The ownership of equipment was covered by the indefinite question, "Films etc., owned by the department * * *." Data, apparently incomplete, indicate that 8 departments owned stereopticon slides, and that 4 departments possessed motion picture films. In one city, the ownership of a motion picture machine was reported. Materials were provided in a few instances by the State department of health.

Jersey City reported the use of lantern slides in theaters.

Pamphlets.—The utilization of pamphlets in popular health education was covered by a specific line in the schedule of questions. Only 29 departments of health, however, reported the use of pamphlets or circulars, and these provided a surprisingly limited number in view of the extensive use of the pamphlet by other agencies.

Chicago did not state the number of pamphlets issued, but reported an expenditure of \$4,000 to \$5,000 a year in this field. Jacksonville published (or distributed) 150,000 pamphlets per year, Boston 138,000, Cleveland 100,000, and Memphis 50,000.

Birmingham, Sioux City, Louisville, Nashville, Syracuse, and Dallas reported quantities ranging from 10,000 to 25,000.

In three instances the information was volunteered that State pamphlets were used, and in two cities pamphlets published by the Metropolitan Life Insurance Co. were used.

Annual reports.—In 39 cities an annual report was printed, in 25 of which there were 500 or more copies available. Chicago issued 5,000 copies of a 448-page report costing \$7,500. Los Angeles and Dayton distributed 3,000 each.

The cost of annual reports was mentioned in only a few instances. Only 6 cities besides Chicago used as much as \$500 or more for this purpose. Newark and New Orleans each spent \$800, Seattle \$825, and Washington \$900. Very little information was given on the utilization made of these reports. When but few copies were available, they were apparently distributed among city officials; and when more were printed, they were sent out through various mailing lists.

Monthly bulletins were issued by 39 municipal departments of health, and a quarterly bulletin by one department. In only 18 instances does it appear that as many as 1,000 or more copies were distributed. St. Louis issued an 8 to 12-page monthly bulletin and distributed 8,000 copies. New York, Philadelphia, and Baltimore each distributed 5,000 copies of a monthly bulletin varying in size from 20 pages in New York to 8 pages in Baltimore. In

Detroit, 4,000 copies of a 12 to 20-page publication were distributed, and in Seattle the same number of a 4-page publication. In Dallas an edition of 15,000 copies of a 2-page bulletin (apparently multigraphed) was issued for 4 months and then discontinued.

A limited amount of data was furnished regarding the character of the monthly bulletins. In 15 cities the material used seems to have been primarily statistical and scientific in nature; in 7 cities both scientific and popular; and in 3 cities, wholly or primarily popular.

Detroit reported an expenditure of \$333 per month on its monthly bulletin, and Philadelphia \$250. Rochester appears to have issued the most expensive monthly bulletin, appropriating \$227.50 per month for 1,000 copies of a 12-page publication.

Weekly bulletins, apparently of a statistical and scientific nature, were published in Baltimore, Washington, Detroit, Minneapolis, Syracuse, and New York, the last named city issuing the largest number, namely, 11,000 copies.

Chicago seems to have been the only city whose health department published a popular weekly bulletin. Six thousand to ten thousand copies were issued.

Circular letters were utilized in Flint in reaching teachers and other citizens, and in New Haven, they were distributed among physicians.

Exhibits.—Virtually one-half of the 100 municipal health departments reported the use of some kind of exhibit during the year, in a number of cases an inexpensive set of cards, probably, and in other instances, an elaborate display of various devices. (A few additional cities used exhibits during years previous to the one reported on.) In 10 cities the health departments prepared exhibits for health shows, in one or more cases like those conducted by the National Health Shows, Inc. In 18 cities exhibits were prepared for State and county fairs, food shows, industrial expositions, and similar enterprises, including 4 exhibits displayed in store windows. The character and place of the exhibit was not stated in 21 reports, but it was a small one, presumably, used for women's clubs and other organizations.

Twelve cities stated that an exhibit was displayed at the health department office. In some instances, however, this exhibit apparently consisted of only a few charts and pin maps to which the public was not especially invited.

Although clinic waiting rooms and health centers are not named specifically in the schedule of questions, 3 departments reported that exhibit material was displayed in such places.

The amount of money invested in exhibit material was indicated in only a few instances. Birmingham and Detroit reported the expenditure of \$1,000 for exhibit purposes, and Jacksonville and Newark, \$500 each. The municipal health department in Boston spent \$1,190 in preparing material for the Boston Health Show.

Special measures.—Radio health talks were reported by the Philadelphia, Cleveland, and Newark departments of health, weekly by Philadelphia and at two-week intervals by Cleveland.

The street-car poster was used in Jacksonville and Duluth.

A float, presumably for a street parade, was prepared by the Syracuse department.

Memphis conducted three "rat campaigns."

Philadelphia appears to have emphasized health weeks of various kinds, celebrating a "negro week," "clean-up week," "diphtheria week," and a "boys' week."

Activities of voluntary agencies.—The work of voluntary agencies was mentioned in 60 reports, although many of these do not give the name of the agency cooperating. The local tuberculosis association is mentioned most frequently, 26 times. Public health associations or federations are named 10 times, municipal organizations 7 times, the Metropolitan Life Insurance Co. 4 times, child welfare organizations 3 times, and the Red Cross twice. Among other organizations mentioned once or twice are the following: Chamber of commerce, masonic order, community council, civic center, social hygiene society, antimalaria association, medical society, medical school, and a condensed milk company.

In Syracuse a special department in the public library has been created for books on health, hygiene and sanitation.

PUBLICITY

A distinction quite properly has been made by health authorities between popular health education and publicity measures. This should not be ignored. The aim of the former is to provide the people, especially the general nonschool-attending public, with information regarding disease and hygiene and to influence the people's behavior in such a way that they will avoid exposure to disease when possible and, if they become infected, refrain from exposing other persons.

The object of publicity work is to so inform the people regarding the activities of the health department that they will give it their moral and financial support. Probably many of the measures under discussion perform both functions. When a story on diphtheria

appears in a newspaper urging the utilization of toxin-antitoxin, and stating incidentally that the city's diphtheria death rate has decreased so many points as a result of the activities of the health department, valuable health information is thereby disseminated and the interest of the people in their department of health is stimulated. It should be borne in mind, therefore, that while the primary object of all or most of the work described above has been the education of the people in matters of health, many of these measures, particularly newspaper articles, have strengthened the people's allegiance to the health department.

GENERAL CONSIDERATIONS

Popular health education is becoming recognized as one of the essential functions of every municipal health service. Reasonable success in any program intended to enlighten the public and to secure its cooperation in a progressive and effective campaign for health conservation requires provisions for developing and extending the activities now carried on.

Thus far, according to a prominent city health commissioner, "hit or miss" methods have been utilized. As a rule there has been no clear understanding of the real purpose or application of the various educational measures. The art of popular appeal to the masses as a means of spreading the gospel of health has not been mastered sufficiently to permit the definition of standard machinery or procedures.

But, on the basis of present knowledge and experience, much more can be done than is being done. Many factors will influence and determine the character and scope of the educational program best suited to each community. The distribution of population in respect to economic, social and intellectual status, also to citizenship and race; the nature of public health problems requiring adjustment or solution; the exact machinery of government best suited to the purpose; and the resources and facilities needed for a comprehensive, impelling campaign, must all be considered.

Supervision over health education activities and the responsibility for the successful development of so important a feature of local health service should not be left to the ingenuity or zeal of subordinate positions in the health department. The decision as to the desirability or necessity of establishing a separate or distinct bureau or division of health education within the health department should be left in each instance to the judgment and discretion of the local health officer, who is acquainted with the general trend of the situa-

tion, and who perhaps more than any other has his finger on the public pulse. In the larger cities the organization within the health department of a separate or distinct bureau of popular health education and publicity seems necessary and advisable, and it should be considered seriously in all cities having a population of 100,000 or over. If this is not practicable, surely a competent person should be employed and placed in charge of this work, preferably under the immediate general direction of the executive officer of the department.

Whatever provision is made in the organic structure of the health department, a very definite and constructive policy should be the objective, and ample provisions should be made for inaugurating and continuing a far-sighted, city-wide program of popular health education that should keep pace with the intellectual capacity of the community and at the same time anticipate its potential possibilities.

Without attempting, therefore, to present any detailed outline of organization or program, the following recommendations are intended merely to emphasize certain features and a few of the more fundamental principles and devices that are involved.

RECOMMENDATIONS

In the first place, all popular health education activities undertaken by the health department should be developed and carried on under the immediate direction or general supervision of a trained or experienced director. Wherever it is possible to engage the services of a qualified director, he should occupy virtually the same relative position in respect to the health officer as is now assigned to heads of principal bureaus. He should be either the head of a separate bureau or an assistant working directly under the health officer.

Adequate clerical assistance should be provided. In some instances, part of this can be supplied from the regular staff of the central administrative office or by part-time service from other bureaus of the department. Machinery and facilities for multigraphing, tabulating, and other similar service may be required. A definite allotment of funds should be secured for exhibits, pamphlets, bulletins, and other materials.

Health education is a comparatively new field of activity in municipal health department practice, and the available supply of properly trained or experienced personnel capable of assuming direction of these activities is limited. Men and women may be found, however, who are well adapted to the demands of such service. Among other qualifications that should be prescribed for this position, consideration should be given to the following: (1) A college education

or its equivalent; (2) a knowledge of personal hygiene and public health work, preferably with experience; (3) a sound conception and understanding of mass psychology; (4) a scientific viewpoint; and (5) a profitable experience in the preparation of educational material intended for popular consumption and enlightenment. Newspaper or magazine writers may at times qualify as directors of health education, but success in this field requires more than the ordinary attainments of a good reporter.

For those having the fundamental requirements, facilities for special training may be arranged. When a suitable director has been selected, he should be given opportunity to acquaint himself with the educational activities of the more progressive departments of health and to confer with recognized leaders in this field. Certain special courses in psychology, now offered at some universities, will also prove helpful.

Secondly, in setting up a program of work in popular health education the local field should be systematically studied, objectives should be set up, a program adopted, and a budget approved for carrying out this program. Many questions must be considered, such as the following: What types of popular health education will most effectively reach the largest number of persons in the city? Specially, what should be the object of newspaper articles? Is the proposed pamphlet adapted to the intellectual capacity of the group for which it is intended? Is a certain lecture or motion picture psychologically sound—by rousing fear may it possibly do more harm than good? May the need of the community best be served by locally prepared health talks in newspapers or by syndicated articles? Under what conditions may both be used? If syndicated articles appear more desirable and are not used, how can the newspapers be interested in using them? Considering the funds available, the extent and character of the population, and the diversity of its needs, specifically what types of measures should be utilized and what should be the function of each? Only painstaking study will make possible an adequate answer to these and many similar questions.

Thirdly, the activities of all voluntary agencies in the field of popular health education should be correlated under the general leadership of the department of health, provided a trained officer is in charge. Women's clubs, business men's organizations, and other civic agencies, as well as tuberculosis, cancer, mental hygiene, and child-health groups, have convincingly demonstrated their interest in popular health education. By providing for the systematic participation of these organizations not only may overlapping of effort be prevented but in addition a larger volume of work may be made possible.

In general, a program of popular health education should include the following measures, named in order of their probable effectiveness:

(1) The preparation of regular health articles, news stories, and special feature stories for the daily press. Probably more persons can be reached regularly by the newspaper than by any other educational measure. The interest of representatives of the press should be systematically cultivated. Through a proper spirit of cooperation, invaluable aid may be given by newspaper to health department and by health department to newspaper without cost to either.

(2) A corps of lecturers should be organized, consisting of health-department employees, members of the local board of health, and of the local medical society. Systematic measures should be utilized in making these lecturers available to men's and women's clubs, churches, and fraternal orders, and all kinds of civic organizations.

(3) Pamphlets of instruction in hygiene should be distributed with the aid of civic organizations. Special attention should be given to making them attractive.

(4) Exhibits should be prepared for enterprises and shows of various kinds, as well as for meetings of civic organizations.

(5) A monthly bulletin may be issued for the purpose of informing physicians, nurses, and other health workers regarding current local health problems. A simple, brief, annual report should be prepared for the purpose of winning the intelligent support of influential citizens to the work of the health department. If a detailed statement seems desirable, it may be typed and distributed to the limited number of people interested.

(6) Radio health talks, street-car posters, special campaigns, and other measures may be added when in the judgment of the executive officer they promise to be more effective than longer established measures.

Finally, adequate funds should be made available. In addition to the necessary clerical assistance, the following budget will probably represent the minimum expenditure consistent with a reasonably adequate program for the average city of 100,000:

Salary, chief of bureau of popular health education and publicity or of whole-time assistant in charge of work-----	\$3, 500
Stenographer serving also as general assistant-----	1, 800
Printing, exhibits, and incidental expense-----	4, 000
	<hr/>
Total-----	9, 300

The actual allotment set aside or applied specifically to health education will not usually indicate the volume or extent of these

activities. However, it may always be difficult to produce sufficient evidence of benefit derived to justify any expenditure, large or small, in terms of results accomplished or any objective index of improved healthfulness of the community. Nevertheless, the need for proper health education has been established; and the benefits to be derived from a determined effort to educate the individual and the public in the essentials of healthy living will gradually accumulate and become increasingly manifest.

III. VITAL STATISTICS

LOUIS I. DUBLIN, Ph. D.

Statistician, Metropolitan Life Insurance Co.

Vital statistics are more and more being recognized as an integral function of health department work, and are constantly attracting more serious attention from health officers everywhere. The fast growing area under Federal registration is impressive, having increased in coverage, as regards death registration, from 82.3 per cent of the population of the United States in 1920 to 88.4 per cent in 1925, and from 59.8 per cent to 76.1 per cent in the same years as regards birth registration. "Every State in the registration area by 1930," the slogan of the Census Bureau, seems a very real possibility—not a pious wish or idle fancy. Nevertheless, it is still true that statistical work is one of the least developed activities of municipal health departments.

The science of vital statistics is a new one whose rules and practices, as applied to health administration, are not yet fixed or definitely formulated. It has been developed largely as a method of control and for purposes of research; it is not often closely connected with specific, urgent, or emergency health measures; it often necessitates a special technique with which most health officers are unfamiliar. Not knowing exactly how to derive the greatest profit from such work, they naturally do not provide for it in their budget. On the other hand, health officers who do appreciate the value of good vital statistics are not always able to obtain the necessary funds for this activity from city authorities; nor can they always enlist cooperation from the rank and file of the medical profession who, in the last analysis, are the chief sources of information. After all, the physicians must supply the records comprising the data upon which public health statistics are built up. A real opportunity still exists to standardize statistical procedures and adapt them to the service of American public health work.

At the very outset, the several activities which make up the statistical work of health departments must be differentiated. Many health officers consider that the registration of births, deaths, and perhaps cases of sickness completes the vital statistics work useful to their departments. This is, however, only the beginning. In

addition, there is the important function of investigation which involves tabulating the registration of births, deaths, and sickness and analyzing and interpreting these tabulations. Perhaps equally important is the instigation of studies into the make-up of the population and into special phases of the public health. Properly conducted, such investigations of the public-health statistician should show what the program of the health officer has accomplished and what new activities are called for; their results should guide the health officer in developing new policies. When thus used, the vital statistics division becomes an essential part of the health officer's organization and the research or checking agency which separates the good from the bad and determines the degree of success attained by the various divisions of the department. The vital statistics work of very few health departments is animated by this spirit, though it is obviously the only constructive program for the future.

JURISDICTION

In a number of our cities, the registration of vital statistics antedates the organization of public-health work. It is not surprising, therefore, to find occasionally that registration is outside the jurisdiction of the health department. In the year 1923, when this survey was made, we find that the health department had local jurisdiction in 66 out of the 100 cities studied.

The exceptional situations in many cases arise from the working out of different State registration laws. In Massachusetts, for example, vital-statistics registration is under the control of the secretary of state. In those cities where the health officer is not the local registrar or is not directly over the registrar he has not direct access to birth and death certificates and he receives copies of them from the town clerk only as a courtesy. These reach him late, and because of his lack of responsibility he is not likely to use them constructively.

Even in those States where jurisdiction is with the State department of health, the local health officer may not be in charge of registration. In most of the 24 cities¹ where this appears to be the case the registrar is appointed by, and is directly responsible to, the State board of health. This results in confusion of responsibility, and duplication of function often results under such conditions as contrasted with the simple and effective administration when the principal health officer is either the registrar or the responsible official to whom the registrar reports.

¹Atlanta, Albany, Bayonne, Des Moines, Elizabeth, Harrisburg, Jersey City, Kansas City, Kans., Knoxville, Louisville, Manchester, Memphis, Nashville, New Haven, Newark, Pittsburgh, Reading, St. Paul, Scranton, Sioux City, Tulsa, Waterbury, Wichita, Wilkes-Barre.

TABLE I.—Basic data on vital statistics, 100 cities, 1923

	Registration under what department	Salary of registrar	Expenditure for vital statistics by health department		Fees	Per cent completeness in reporting				Time given by registrar	
			Total	Per capita		Deaths		Births			Still-births, 1923
						1923	1920	1923	1920		
GROUP I											
Baltimore.....	Health department.....	(1) \$4,000.00	\$13,454.97	\$0.017	\$2,787.50	100	100	98	(*)	Part time. ¹ Whole time.	
Boston.....	Registrar under secretary of state.		14,339.42	.019	(*)	100	100	(*)	(*)		
Buffalo.....	Health department.....	3,600.00	15,176.46	.028	2,697.00	100	(*)	(*)	95	Do.	
Chicago.....	do.....	4,200.00	51,061.89	.018	14,734.50	100	99	93	80+	Do.	
Cleveland.....	do.....	(*)	11,014.00	.012	1,786.00	99+	100	95	70	Part time. Whole time. ⁵	
Detroit.....	do.....	52,520.00	35,980.00	.036	2,259.00	100	100	95	90		90
Los Angeles.....	do.....	(1)	8,627.11	.013	(*)	100	(*)	90	(*)	Part time. ¹ Whole time.	
New York.....	do.....	5,500.00	123,257.58	.021	(*)	100	(*)	99	82		95
Philadelphia.....	do.....	1,500.00	18,442.19	.010	(*)	100	100	95	90-95	Do.	
Pittsburgh.....	Registrar for State board of health.	1,500.00	4,678.62	.008	(*)	100	100	80	90-95	Do.	
San Francisco.....	Health department.....	(1)	8,316.79	.015	.75	100	(*)	97	(*)	Part time. ¹ Do. ¹	
St. Louis.....	do.....	(1)	5,436.00	.007	State, .50	100	93	80	90		100
Total Group I.....			Av. (12).....	.018	Av. (6) 4,202.58	-----	-----	-----	-----	{ 7 whole time; 5 part time.	
GROUP II											
Cincinnati.....	Health department.....	Fees+1,600.00	3,580.00	.009	1,000.00	100	100	98	98	Whole time.	
Columbus.....	do.....	Fees.	(*)	(*)	273.00	100	95	95	100		Part time.
Denver.....	do.....	1,920.00	2,270.00	.008	±500.00	100	90	90	90+	Part time.	
Indianapolis.....	do.....	(*)	(*)	(*)	(*)	100	100	100	98		Part time. ⁷ Whole time. ⁶
Jersey City.....	County health department	73,500.00	(*)	(*)	3,200.00	100	(*)	97	(*)	Do.	
Kansas City, Mo.....	Health department.....	1,620.00	3,120.00	.009	(*)	±100	±80	90	90		Do.
Louisville.....	Registrar for State board of health.	(*)	(*)	(*)	(*)	90	100	90	98	Part time. ¹ Do.	
Milwaukee.....	Health department.....	(1)	6,160.72	.013	755.00	100	95—	98	95+		Do. ⁷
Minneapolis.....	do.....	(1)	6,307.53	.015	(*)	100	100	95	(*)	Whole time.	
Newark.....	City clerk.....	72,400.00	5,200.00	.012	1,850.00	100	(*)	99	(*)		Part time. ¹ Whole time.
New Orleans.....	Health department.....	3,300.00	17,054.32	.042	15,965.50	100	100	95	98	Part time. ¹ Whole time.	
Portland.....	do.....	(1)	(*)	(*)	458.50	100	(*)	98	(*)		Part time. ¹ Whole time.
Rochester.....	do.....	Fees+1,900.00	6,572.81	.021	150.00	100	100	99	97-98	Part time. ⁶	
Seattle.....	do.....	(6)	3,480.00	.011	(*)	99 3/4	(*)	97	(*)		

Toledo Washington	do do	Fees+1,200.00 2,040.00	2,550.00 9,010.00	.010 .019	(4) .50	(*) (*)	100 100	100 100	95 96	95 90-5	100 100	Whole time. Do.
Total Group II	{Health department----- 13 Other----- 3}	Av. (9) 2,164.00	Av. (11 cities)---	.016	-----	Av. (9) 2,683.56	-----	-----	-----	-----	-----	{ 8 whole time; 8 part time.
GROUP III												
Akron	Health department-----	Fees+2,575.00	5,185.00	.025	2.50	(*)	100	100	100	95	100	Whole time.
Albany	Separate bureau under State.	2,000.00	(*)	(*)	2.25	(*)	100	100	99	99	80	Do.
Allentown	Health department-----	Fees.	(*)	(*)	State.	(*)	100	(3)	100	(3)	100	Part time.
Atlanta	Registrar for State board of health.	Fees=±4,500.00	(*)	(*)	.50	500.00	100	100	80	72	(*)	Whole time.
Bayonne	County health department	Fees=186.50	2,000.00	.024	2 County.	(*)	98	(3)	90	(3)	(*)	Part time.
Birmingham	Health department-----	2,100.00	1,950.00	.010	None.	-----	99	99	96	90	99	Whole time. ⁶
Bridgeport	do-----	(1)	4,350.00	.030	.50	678.00	100	100	95	70+	(*)	Part time. ¹
Cambridge	City clerk under secretary of state.	73,800.00	(*)	(*)	.50	(*)	100	(*)	80	(*)	100	Do. ⁷
Camden	Health department-----	(1)	(*)	(*)	.50, 1.00	(*)	100	(*)	90	(*)	100	Do. ¹
Canton	do-----	1,200.00	(*)	(*)	.50	(*)	100	100	100	92	100	Whole time.
Dallas	do-----	1,800.00	3,670.49	.020	None.	(*)	100	95	95	90	100	(*)
Dayton	do-----	Fees+1,500.00	(*)	(*)	.50	285.00	100	100	97	95	(*)	Part time.
Des Moines	Registrar for State board of health.	Fees.	(*)	(*)	(4)	(*)	100	90	92	90	(*)	Do.
Duluth	Health department-----	(1)	(*)	(*)	.50	(*)	100	95	98	90+	95	Do.
Elizabeth	City clerk under State board of health.	(*)	(*)	(*)	.50	(*)	100	100	98	100	100	Do.
El Paso	Health department-----	1,500.00	1,500.00	.016	.50	(*)	100	(3)	98	(3)	90	Whole time.
Erie	do-----	¹ Fees.	(*)	(*)	State.	(*)	100	100	99	99	(*)	Part time.
Evansville	do-----	(*)	(*)	(*)	.50	15.00	100	(3)	100	(3)	(*)	Do.
Fall River	City clerk under secretary of state.	73,700.00	(*)	(*)	.50	(*)	99	100	95	95	(*)	Do. ⁷
Flint	Health department-----	(1)	1,352.17	.011	.50	54.50	100	98	95	95	98	Do. ¹
Fort Wayne	do-----	(1)	1,200.00	.013	2, 4	(*)	100	(3)	95	(3)	(*)	Do. ¹
Fort Worth	do-----	(*)	(*)	(*)	None.	(*)	(8)	90-	(8)	90-	(*)	Do.
Grand Rapids	do-----	(1)	1,600.00	.011	.25	(*)	100	100	100	100	100	Do. ¹
Harrisburg	Registrar for State board of health.	(*)	(*)	(*)	No copies.	(*)	100	(3)	98	(3)	95	Do.
Hartford	Health department-----	(1)	2,700.00	.018	.50	(*)	100	100	99	98.2	100	Do. ¹
Houston	do-----	1,800.00	1,600.00	.010	.50	(*)	100	95	95	95	(*)	Do.
Jacksonville	do-----	Fees+2,700.00	(*)	(*)	(4)	±100.00	95	100	80	97	95	Whole time.

* Not available or not stated for 1923.

¹ Part of duty of health officer; no separable salary.² If certified.³ Not included in 1920 study.⁴ Fee charged; amount not stated.⁵ Head of the bureau is epidemiologist; registration under whole time chief vital statistician, at \$2,520.⁶ Health officer is nominally registrar; whole-time deputy the real registrar, his salary stated.⁷ Part time only to vital statistics, only whole-time salary available.⁸ Incomplete.

TABLE I.—Basic data on vital statistics, 100 cities, 1923—Continued

	Registration under what department	Salary of registrar	Expenditure for vital statistics by health department		Fees	Per cent completeness in reporting				Time given by registrar
			Total	Per capita		Fee charged for copies	Amount received 1923	Deaths	Births	Still-births, 1923
								1923	1920	1923
GROUP III—Continued										
Kansas City, Kans.....	City clerk under State board of health.	(*)	(*)	(*)	State.		(*)	90	90	(*)
Knoxville.....	Registrar for State board of health.	(*)	\$960.00	\$0.011	None.		(*)	99	(3)	99
Lawrence.....	City clerk under secretary of state.	7 \$2,700.00	(*)	(*)	\$0.50		(*)	100	(*)	(*)
Lowell.....	City clerk, under secretary of state.	7 Fees +2,800.00	(*)	(*)	.25		\$475.00	100	100	99
Lynn.....	do.....	(*)	1,196.00	(*)	.25		198.75	100	100	99
Manchester.....	City clerk, under State board of health.	7 3,000.00	(*)	.012	.50		(*)	100	(3)	98
Memphis.....	Registrar for State board of health.	(*)	(*)	(*)	.50		(*)	91	100	90
Nashville.....	do.....	Fees.	(*)	(*)	State.		(*)	100	(*)	(*)
New Bedford.....	City clerk, under secretary of state.	7 3,800.00	(*)	(*)	.25		850.00	100	100	100
New Haven.....	Registrar for State.....	2,640.00	(*)	(*)	.50		3,215.00	100	100	100
Norfolk.....	Health department.....	1,500.00	(*)	(*)	.50		159.00	100	100	(*)
Oakland.....	do.....	(1)	9,263.00	(*)	(4)		582.00	100	(*)	(*)
Oklahoma City.....	do.....	(1)	2,500.00	.039	None.		(*)	99 3/4	99	100
Omaha.....	do.....	Fees +1,800.00	2,500.00	.025	.50		(*)	100	95	100
Paterson.....	do.....	2,500.00	3,310.61	.009	(4)		1,693.00	100	(*)	100
Peoria.....	do.....	1,090.00	1,059.00	.024	.50		+60.00	(*)	(3)	(*)
Providence.....	do.....	2,750.00	16,676.87	.013	.50		1,533.04	100	100	100
Reading.....	Registrar for State board of health.	Fees.	(*)	.069	State.		(*)	100	100	100
Richmond.....	Health department.....	(1)	(*)	(*)	None.		(*)	100	100	100
St. Joseph.....	do.....	7 1,200.00	(*)	(*)	None.		(*)	100	(3)	100
St. Paul.....	Registrar for State board of health.	(*)	9,578.75	(*)	None.		(*)	100	95+	100
Salt Lake City.....	Health department.....	1,800.00	1,620.00	.040	.50		315.00	100	95	100
San Antonio.....	do.....	1,800.00	2,100.00	.013	(4)		(*)	100	90+	100
San Diego.....	do.....	(1)	1,620.00	.011	.50		229.50	100	(*)	(*)
Savannah.....	do.....	1,440.00	1,400.00	.019	None.		(*)	100	90+	(*)
Schenectady.....	do.....	2,100.00	4,050.00	.016	No copies.		(*)	100	98	100

Scranton.....	Registrar for State board of health.	1, 200. 00	(*)	(*)	State.	(*)	100	(*)	75	(*)	(*)	Part time.
Sioux City.....	do.....	Fees.	(*)	(*)	(4)	(*)	100	(3)	(*)	(3)	(*)	Do.
Somerville.....	City clerk, under secretary of state.	7 3, 800. 00	(*)	(*)	.50	(*)	100	100	95	100—	(*)	Do. ⁷
South Bend.....	Health department.....	(*)	(*)	(*)	None.	(*)	100	(3)	95	(3)	100	Do.
Spokane.....	do.....	(*)	(*)	.016	.50	(*)	100	(*)	99	(*)	100	(*)
Springfield.....	City clerk, under secretary of state.	7 3, 900. 00	(*)	(*)	2.35	(*)	99	99	97	(*)	(*)	Part time. ⁷
Syracuse.....	Health department.....	2, 000. 00	(*)	.024	.50	(*)	100	100	100	95—100	100	Whole time.
Tacoma.....	do.....	3, 000. 00	(*)	(*)	.50	(*)	100	(*)	97	(*)	99	Part time.
Trenton.....	do.....	2, 600. 00	(*)	.052	(4)	(*)	100	100	99	98	(*)	Whole time.
Troy.....	do.....	1, 200. 00	(*)	.029	(*)	(*)	100	(3)	99	(3)	60	Do.
Tulsa.....	Registrar for State board of health.	Fees.	(*)	(*)	(4)	(*)	100	(3)	90	(3)	(*)	Part time.
Utica.....	Health department.....	1, 500. 00	(*)	.039	.25	(*)	100	100	100	100	(*)	Whole time.
Waterbury.....	City clerk, under State board of health.	7 Fees+500. 00	(*)	(*)	.25	(*)	100	(3)	98	(3)	90	Part time. ⁷
Wichita.....	do.....	(*)	(*)	(*)	State.	(*)	100	(3)	95	(3)	100	Do.
Wilkes-Barre.....	do.....	(*)	(*)	(*)	State.	(*)	99	(3)	(*)	(3)	(*)	Do.
Wilmington.....	Health department.....	(1)	(*)	(*)	(4)	(*)	100	(*)	100	90+	75	Do. ¹
Worcester.....	City clerk, under secretary of state.	7 3, 400. 00	(*)	(*)	.25-0.50	(*)	100	100	(*)	(*)	(*)	Do. ⁷
Yonkers.....	Health department.....	1, 800. 00	(*)	.029	None.	(*)	100	(*)	100	(*)	100	Whole time.
Youngstown.....	do.....	7 2, 880. 00	(*)	.011	(4)	(*)	100	100	99	95	100	Part time. ⁷
Total Group III.....	{ Local health depart- ment..... 43 Other..... 29	{ Av.(38) 2, 247. 00 Av. (32 cities)-----	{ Av. (32 cities)----- Tot. 483, 005.30 (55 cities)-----	{ .024 Av. .019	{----- -----	{ Av.(22) 544. 01 { Av. 1, 657. 72 (37 cities)-----	{----- -----	{----- -----	{----- -----	{----- -----	{----- -----	{22 whole time; {46 part time.
Average or total.....	{ Local health depart- ment..... 66 Other..... 34	{ Av. 2, 364. 00 (54 cities)-----	{----- -----	{----- -----	{----- -----	{----- -----	{----- -----	{----- -----	{----- -----	{----- -----	{----- -----	{37 whole time; {59 part time

* Not available or not stated for 1923.

¹ Part of duty of health officer; no separable salary.

² If certified.

³ Not included in 1920 study.

⁴ Fee charged; amount not stated.

⁷ Part time only to vital statistics, only whole-time salary available.

REPORTING OF DEATHS

As the 100 cities of this study are practically all in the death registration area (the only exceptions are Fort Worth and Tulsa), the registration of deaths is reported to be virtually complete in most of them. Of the 98 cities giving definite figures in 1923, 85 reported a 100 per cent completeness of registration and 8 others (Birmingham, Fall River, Oklahoma City, Knoxville, Springfield, Wilkes-Barre, Cleveland, and Seattle) a completeness of 99 per cent. This record is a very definite advance over that of 1920, when in our first investigation but 42 of 62 cities reporting on this question claimed 100 per cent completeness in death reporting.

REPORTING OF BIRTHS AND STILLBIRTHS

Birth registration, which is a newer activity, is much less completely carried out. Only 79 of these cities are in the birth registration area. Only 12 cities claim a 100 per cent completeness, Indianapolis of the second group and 11² of the third group, though over half (59) of the cities report from 95–99 per cent completeness (8 of the first group, 12 of the second group, and 39 of the third group). Fifteen cities report 90 to 94 per cent completeness and 10 cities less than 90 per cent. The lowest record is 75 per cent, found in Scranton.

During the interval between 1920 and 1923, 13 cities registered the same percentage of births (only 2 of these being 100 per cent). Thirty-three, however, improved their record of reporting, Bridgeport, for instance, increasing from a little over 70 per cent in 1920 to about 95 per cent in 1923, and New York from 82 to 99 per cent. This is a very encouraging record and shows the result of persistent effort on the part of health officials to make the public and physicians realize the importance and necessity of registering each birth. It is less encouraging, however, to note that 11 cities have a poorer record in 1923 than in 1920, that of Kansas City, Mo., for example, falling from 90 per cent of births reported in 1920 to about 80 in 1923, and Jacksonville from 97 per cent to 80 per cent. In spite of the fact that the larger cities with their many facilities for follow-up and recording of births should lead the way, three of the first group cities, Baltimore, Pittsburgh, and St. Louis, had a worse record in 1923 than in 1920.

Of the 66 cities giving such information, the reporting of stillbirths was 100 per cent complete in 41 cities, between 95 and 100 per cent complete in 17, between 90 and 94 per cent in 5, 80 per cent in Albany, 75 per cent in Wilmington, and 60 per cent in Troy.

²Akron, Allentown, Canton, Evansville, Grand Rapids, Paterson, Reading, Syracuse, Utica, Wilmington, Yonkers.

In the reports of these surveys comment was made that the best registration is apparently obtained in cities where the local health department has immediate responsibility. With few exceptions, poor registration results from vesting local authority in the hands of other than the health officer. Especially in the case of birth registration, the immediate utilization of the birth certificates by the health officer in his infant-hygiene program stimulates physicians and midwives to file complete records at an early date. Where no such use of birth certificates is made, registration is generally carried out in a perfunctory manner. The collection, the recording, and the prompt transmission of birth and death certificates to the State authorities are the first duties of the municipal registrar. The success or failure of a vital-statistics division depends upon the efficiency with which these primary functions are carried out; other activities can be undertaken only after these fundamental ones are first fulfilled.

PROSECUTIONS FOR NONREPORTING

No prosecutions were on record for the nonreporting of deaths in our 1920 investigation. In 1923 four cities report such prosecutions. In Birmingham four out of the five prosecuted were convicted, and in Dallas all three were convicted. Prosecutions are on record for nonreporting of births in 1923 in nine cities; 22 cases were prosecuted and 15 of these were found guilty. A number of cities report that prosecution for nonreporting is a State function. Evidently the registrar can gain more by cooperation with physicians, the usual practice, than by attempts to coerce them.

RECORDS AND REPORTS

Nearly all of the municipal health departments studied make tabulations of some kind from the birth and death certificates which they receive, regardless of whether they carry on registration or not. These tabulations are intended to serve either as unpublished office manuscripts, or provide the data for a variety of tables in weekly, monthly, and annual reports. Very often where no formal printed or multigraphed weekly, monthly, or annual report is circulated by the health officer, convenient summaries are submitted to the local newspapers, thus furnishing sources of information on facts of the local vital statistics. This is true in a number of cities including Birmingham, Camden, Elizabeth, Jacksonville, Oklahoma City, Scranton, Sioux City, and Knoxville.

Deaths are classified by sex, age, and cause in 84 cities, and by nativity in 66. Other classifications are also found, color and marital condition being the most common ones.

The standard certificates of the United States Bureau of the Census are used for recording both births and deaths in all but nine cities. Manchester, Lawrence, and Lowell specify that State forms are employed in reporting births; while Hartford, New Haven, and Wilkes-Barre employ State forms for both births and deaths. Fall River, Washington, and Providence do not specify the form used. Information is lacking for Worcester. Of 99 cities reporting, 92 show that deaths are classified according to the International List of Causes of Death (Dallas and Milwaukee still use the 1910 list); while seven, Rochester, San Antonio, Peoria, Wilkes-Barre, Allentown, Reading, and Nashville, give a negative reply; the three latter use a State list of causes of death.

WEEKLY REPORTS

Of the 12 cities in the first group 5 (Boston, Chicago, Detroit, New York, and Pittsburgh) issue weekly reports. Boston's report consists of a very brief statement of the number of deaths from the principal causes, while Pittsburgh sends out a mimeographed morbidity and mortality sheet. Chicago, Detroit, and New York issue printed bulletins of three or four pages. In the second group, Milwaukee and Washington issued weekly reports in 1923, although Milwaukee discontinued the practice in 1924. In the third group of cities Syracuse is the only one which issued a weekly bulletin in 1923. Albany started a weekly bulletin in August, 1924.

The statistical material in these bulletins is decidedly scrappy and not at all uniform. It would be highly desirable for all of the cities to issue simple, uniform weekly statements which would supplement what the general statistical reader obtains from the weekly Public Health Service Reports and from the Census Bureau Weekly Health Index. Of the cities of 100,000 population and over, all but Reading, Elizabeth, Scranton, Tulsa, and Utica send weekly reports to the Census Bureau.

MONTHLY REPORTS

Monthly bulletins are issued by all the cities in the first group except Chicago and San Francisco. In Chicago, however, a brief monthly report of morbidity and mortality is given in the weekly report. The monthly reports of Cleveland and Pittsburgh are typed statements of the number of cases of communicable diseases and the number of births and deaths. St. Louis issues two monthly bulletins, one containing vital statistics only and the other containing popular health information. This is an unusual arrangement, as most of the cities combine vital statistics with general health material in the

same bulletin. Eight cities of the second group issue monthly bulletins. Toledo prints the monthly morbidity and mortality statement in the weekly journal which covers the activities of all the city departments. Jersey City includes her brief report with that of the other Hudson County towns and cities in a monthly vital statistics sheet. In the third group of cities, 18 issue a monthly bulletin, Bayonne, in addition, having a very brief report in the Hudson County monthly vital statistics sheet. Cambridge and Manchester issue quarterly reports.

The monthly reports are the most useful because of their timeliness. As to their actual content, they usually include a summary of the number of deaths which occurred during the preceding month, by principal causes, and in a number of instances by broad age groups, singling out especially the deaths of infants under 1 year. There is also a table showing the number of births reported, and one showing the major notifiable diseases registered during the month. Besides these tables, there is very little uniformity among the published tabular reports. Summaries of the activities of the various divisions are often given.

There is need for standardization in the reporting of essential items. Some arrangement such as the general tables published monthly by the New York City department of health could profitably be adopted by the larger cities. In addition to facts on causes of death, the cities should agree upon a regular form for the reports of the principal notifiable diseases and of births and marriages.

ANNUAL REPORTS

Annual reports are published in seven³ cities of the first group. Detroit does not have an annual report, but a brief annual summary appears in one of the monthly bulletins. Of the second group cities, Newark, Portland, Rochester, Seattle and Washington publish independent annual reports. New Orleans issues a report biennially. The report of the Milwaukee health department is included with that of the Common Council. The Toledo report is published as a supplement to the weekly city journal and the Jersey City report is included in the Hudson County annual vital statistics statement. Cincinnati published her annual statements in the monthly bulletin for several years, but this bulletin has now been discontinued.

In the third group, separate annual reports are published in 18 cities. In Allentown and Dayton the annual report is published in the monthly bulletin, in Troy, Canton, Paterson and Salt Lake City

³ Baltimore, Boston, Buffalo, Chicago, Los Angeles, New York, Philadelphia.

as a supplement to the monthly bulletin, in Bayonne in the summary sheet of the Hudson County annual vital statistics statement. Albany, Savannah and Omaha include the report of the health department with those of the other city departments. Wilmington issues her reports biennially. A few cities distribute a small number of copies of an annual report to city departments and officials.

The vital statistics sections of the annual reports vary greatly from city to city, depending very largely upon the resources in funds and personnel available. In a number of cities where a fair amount of valuable detail is shown in the published reports, the date of issue is much delayed, presumably by inadequate clerical assistance to take off tabulations and to prepare the material for the printer. When these reports appear they are already out of date. But, apart from this criticism, the annual reports of the larger cities are often valuable documents. Those from the cities of New York, Chicago, Philadelphia, Boston, and Providence are replete with useful information. The New York report usually contains excellent historical tables on the course of mortality from the principal causes of death. These tables have been supplemented at various times by the issue of condensed reviews and special monographs abstracted from the manuscript and case records in the New York registrar's office. Another commendable activity is the preparation of fairly detailed statistics for sanitary areas in the several boroughs.

The Philadelphia annual report gives extensive and valuable information regarding births by months, ward or residence of mother, by age, color, and nativity of mother, and by occupation of father. Facts for the causes of death are shown according to the detailed International List of Causes of Death with respect to sex, age, nativity, calendar month, and wards. The Philadelphia report is one of the very few which shows annually for certain important causes of death the occupation of the deceased persons. The mortality from some diseases, typhoid fever, for instance, is shown by wards of the city and by calendar year. The infant mortality tables are especially rich in detail. Tables shown in the annual report of the Newark department of health should also be favorably commented upon. The tabular matter is frequently supplemented by graphic charts, and these promote a clear understanding of the historical and comparative facts. The reports of the city registrar of Providence are valuable for their full data on births which show the nativity of parents, age of mother, and other items, and for the instructive arrangement of the tables listing deaths from the principal causes classified according to the sex and age of the decedents.

Only the outstanding features of a few annual reports have been referred to in this review. It is impossible to discuss them at any length because of the great variations that exist in the types of tabulation, in the arrangement of the data, and in the inclusion of special information to fill specific local requirements. There is obviously need for greater uniformity in the character of the reports which cities of various size issue. The section on vital statistics of the American Public Health Association has prepared a set of standard tables for use by municipal health departments which are strongly recommended and which are reprinted at the end of this paper (pp. 80-83).

It should be remembered that the Census Bureau, United States Public Health Service of the Federal Government, and the statistical divisions of the different States issue valuable statistical reports on the mortality and morbidity of the principal cities. Care should be taken to define the scope of all these reports and to avoid duplication. The field for the local authorities is obviously to develop the detailed picture which will facilitate the administrative work of the health department.

PERSONNEL

Under this head, we may consider the registrar or statistician on the one hand, and the clerical staff on the other. The presence of a full-time registrar or statistician depends not only upon the size and financial resources of the city, but equally upon the interest of the health officer in vital statistics as an aid to administration. Thus in the 12 cities of the first group there are six full-time registrars. In Baltimore, San Francisco, St. Louis and Los Angeles the health officer acts as registrar. It is probable that in these cities an acting or deputy registrar cares for many of the duties involved; this is indicated in St. Louis and Los Angeles. In Cleveland the registrar is part-time and in Detroit the real head of the bureau is the epidemiologist, although the chief vital statistician conducts the office on a whole-time basis.

In the 16 cities of the second group, seven report a full-time person in direct charge of vital statistics. The health officer is registrar in Minneapolis, Portland, Seattle, Milwaukee, and Kansas City, Mo. The registrar in Columbus is part-time and the chief clerk in Indianapolis spends but part time on registration, although he gives full time to health work. Likewise the registrar for Jersey City gives full time to the vital statistics of the entire county but only part time to the vital statistics of Jersey City. The whole-time chief clerk in Newark gives part time only to registration.

In the 72 cities of the third group, there are 22 whole-time registrars or chief clerks although it is very probable that some of them only give part time to this particular function. In 46 cities there are part-time registrars, in 12 of these the health officer being the registrar. No information as to the time given by the registrar is available in four cities.

The number and character of the clerical staff varies with the size of the city, with the type of registration law prevailing, and especially with the type of health administration. A health officer who is interested in modern and scientific public health work will insist upon the tabulation and analysis of the vital data of his population, and he will attempt to secure an adequate staff of skilled clerical workers.

In New York City, where excellent traditions of public health work and vital statistics have long prevailed, the staff includes, in addition to the highly skilled registrar, five physicians who are assistant registrars, each supervising a borough, five other physicians who issue burial permits, and 55 clerks. There are two counting-sorting machines used in the preparation of the tables—the equivalent of a considerable number of additional clerks. Disregarding the item of machinery, the number of registration and statistical clerks in New York City is about 1 per 100,000 of population.

It is not possible to give an accurate general impression of the office force assisting the registrar in the 100 cities. Some cities apparently have stenographers and no clerks, others, clerks but no stenographers; where the registrar is the city clerk or local registrar for the state, some assistance is often furnished by clerks of the health department, presumably in compiling the statistics. In Camden, the general office force does this work.

The facts at our disposal clearly indicate that there is a serious deficiency of statistical personnel in the health departments of American cities. To conduct adequate registration of births, deaths and of sickness, and to tabulate and analyze the data so collected, are serious tasks in most cities and require skilled personnel. From the results achieved in New York City, and in a number of other cities where good vital statistics are produced, it would appear that a minimal of one clerical worker for each 100,000 of population is needed to assist the full-time registrar if he is to be well equipped. It is unfair and not at all economical to expect a health officer with his many duties to be the registrar and statistician also, and almost as undesirable to give the registrar untrained or insufficient help. Such tactics are poor economy, for the health service must suffer through the lack of necessary guiding data, or through the misuse of the health officer's or registrar's time.

SALARY OF REGISTRAR

Data on the salary paid to the registrar or statistician are available in 56 cities (this includes registrars who are and those who are not paid by the health department). In some cities, as in Baltimore, Seattle, and Minneapolis, the health officer functions as registrar, and apparently no additional salary is paid. In these cities the actual work is often done by an acting registrar or deputy registrar provided the volume of work is sufficiently heavy; this function, however, in many cities is one of the many duties of the health officer. In other cities, such as Akron, Dayton, and Jacksonville, a small salary is paid the registrar, supplemented by fees, and in a few cities, including Atlanta, Des Moines, and Allentown, the registrar is paid by fees alone.

In the 54 cities where the salary of the registrar is stated the amount varies markedly, depending naturally upon the size of the city. The same degree of skill and administrative ability is not required of a registrar in a small city of 100,000 as in a city of 1,000,000 people. But, while this is generally reflected by the figures, there are striking exceptions, showing how diverse is the conception of city authorities as to the value of such work. Thus, in the seven cities with over 500,000 population which state the salaries paid to registrars, the range is from \$5,500 in New York City to \$1,500 in both Philadelphia and Pittsburgh. The average paid these seven whole-time registrars is \$3,260.

In cities of the second group, the salaries of nine registrars are given. The average salary is \$2,164; individual salaries range from \$1,200 in Louisville and Toledo to \$3,500 in Jersey City. Fees supplement the salaries of the registrars in Cincinnati, Louisville, Toledo, and Rochester. In the 38 cities of the third group with available figures, the average salary paid to registrars was \$2,247. Nearly all of these third-group cities state that the registrar is on whole time; but since the city clerk is registrar in a number of cities, he can but give part time to registration. His total salary is the only one stated, and this, without doubt, accounts for the fact that the average salary for the cities of the third group is higher than that of the second group. The 13 cities in which the health officer himself appears to do this work, and where his salary alone is given, are not included in this average, with the exception of Providence, where the registrar's office is distinct from that of the health officer, with a separate appropriation, the same man being in charge of both offices. In seven cities it is stated that fees supplement the registrar's salary and in eight fees seem to be the only source of payment for this work.

It is clear that the registrar in a considerable number of cities is a clerk acting under the direction of the health officer. Only the routine duties of a registrar can possibly be carried out under these conditions. It is to be seriously questioned whether persons with adequate skill or ability to function as statisticians of health departments of large cities can be found who will accept salaries so low as those we have quoted and which are, in many instances, less than those usually paid to junior clerks in commercial pursuits. Almost without exception the salaries paid to registrars in American cities are too low to insure the proper type of statistical service. The committee in its "Ideal health department for a city of 100,000 population" has suggested a minimum standard for the chief of the bureau of records and statistics a salary of \$2,500. Although the average salaries appear to be higher in 1923 than in 1920, this standard is still far from prevalent in American cities.

COST OF VITAL STATISTICS

It is difficult, because of the great variety of procedures in American cities, to give a satisfactory statement on the cost to municipal health departments of their vital statistics division. As already pointed out, some of the large cities, such as Boston and Newark, maintain a vital statistics division in their health departments, and, in addition, support a registry office in the city clerk's department. In the great majority of cases, however, vital statistics registration is a part of the health department's activities.

Cost data obtained by this survey have not always been classified to show clearly what has been included. In some cities where the registrar is paid by the State, clerical help is furnished and paid for by the health department. The per capita cost of vital statistics to health departments is, however, available in 55 cities. The average cost is 1.9 cents, which is slightly higher than the figure reported in 1920 for 33 cities, 1.6 cents. The per capita cost in the 12 cities of the first group is 1.8; for 11 cities of the second group it is 1.6, and for 32 cities of the third group, 2.4 cents. The per capita cost is, therefore, greatest in the smaller cities, and it is there also that the greatest variations are found. The maximum cost per capita is found in Providence, with its 6.9 cents expenditure, and the minimum in St. Louis, where only 0.7 cent is spent.

In the larger cities there is a little more uniformity of expenditure. In the city of New York, where both registration and vital statistics analysis are admirably conducted, the cost is 2.1 cents per capita, in Detroit 3.6 cents, and in Chicago 1.8 cents. In Boston

1.9 cents is spent, but a considerable additional amount, not recorded, is expended by the division of the city registrar outside of the health department, so that altogether Boston ranks high in the list of large cities for its expenditures for vital statistics. In the cities of the second group New Orleans is the only one with a high per capita expenditure, 4.2 cents. Denver spends but 0.8 cent, Cincinnati and Kansas City, Mo., but 0.9 cent.

In the cities of the third group the following cities show high figures: St. Paul, 4 cents; Schenectady, 4.1 cents; Trenton, 5.2 cents; Providence, 6.9 cents; Utica and Oakland, 3.9 cents. The high per capita cost in Providence may be explained by the uniformly high standard of statistical work conducted there. For many years the annual reports of the registrar have served the health officers of the country as models of form, completeness, and penetrating analyses of the departmental activities.

In view of the accomplishment of New York City and Chicago at costs of about 2 cents per capita, it would appear reasonable to suppose that this size expenditure per capita would accomplish the registration and analysis necessary for the conduct of effective health work in the smaller cities which require fewer tabulations and simpler analyses. Possibly the higher salary of a skilled statistician and a few other items of overhead will make the per capita cost of statistical work greater in the smaller cities carrying out this type of work seriously. The standard per capita budget suggested for a city of 100,000 population in the "Ideal Health Department" was 4.5 cents. It is not always possible to reconcile the high cost of vital statistics work in some of the smaller cities with the character of their published statistical output.

FEEES

Fees are usually charged for transcripts of birth and death certificates, and this source of revenue often determines the amounts appropriated for vital-statistics work. Fifty cents seems to be considered a just fee for this service, since of 69 cities reporting on the amount of the fee it was 50 cents in 45 (in Worcester and Detroit the fee was 50 cents for deaths only, in the former 25 cents for births); 15 cities charged but 25 cents; while 11 cities did not charge for this service. Other fees charged were 35 cents in Springfield for certified copies, 75 cents in San Francisco, and \$1 in Jersey City. The fee varies from 50 cents to \$1 in Baltimore and Camden. Erie, Allentown, and Richmond state that copies are made by the State, but the amount charged is not specified. The amount thus collected varies, of course, with the size of the city and the demand for

transcripts. For the 37 cities reporting the amounts received in 1923, the average figure was \$1,657.72. The size of the sums collected in individual cities ranged from \$15 in Evansville to \$15,965.50 in New Orleans. Sometimes a large amount is collected in a medium-sized city, as in New Haven (\$3,215), indicating perhaps the extent to which the public has been educated to avail itself of the facilities of the registrar. In this way the amount received in fees is perhaps also an index of the completeness of registration and the regard which the community has for the records on file.

The amounts received are credited in the majority of cities reporting on this question to the general fund of the city or the city treasury. In 12 cities, however, the registrar receives the fees collected, and in 6 cities, including Denver, Indianapolis, and Omaha, the fees are credited to the local health department.

SUMMARY AND CONCLUSIONS

1. Vital statistics as an effective agency in public health administration has been developed by only a relatively few municipal health departments.

2. Vital statistics registration is fairly well developed, although death registration still remains better than birth registration. The conduct of registration is still complicated by confusion of responsibility. In some States where the law empowers city or town clerks to register vital statistics, the local health departments have no responsibility for the accuracy or completeness of registration. Under such conditions registration is likely to be unnecessarily expensive and unproductive for constructive health work. The registration of births is then often incomplete, and death registration rather inaccurate as to statements of cause.

3. Nearly all cities issue some form of report. The monthly report is most frequently issued. The tabulation of data in these reports show very little uniformity regarding method of compilation or content. There is great need for agreement among health officers and municipal vital statisticians upon what tabulations are called for in cities of varying population and upon the size and style of report which is most helpful.

4. The registrars are, for the most part, not well equipped for research work; and, in a considerable number of cities, are paid so inadequately as to preclude the employment of competent men. The clerical staffs are often inadequate in number. On the other hand, in many cities the number is sufficiently large to justify the expectation of better work than is now obtained.

A minimal clerical staff of one clerk per 100,000 population, in addition to the registrar or statistician, should generally be sufficient for the conduct of the vital-statistics work of the health department.

5. The average cost of vital-statistics work is 1.9 cents per capita. But there are altogether too many cities which spend next to nothing on their vital-statistics work, and also many cities which, although they spend considerably more than the general average, do not appear to profit particularly from the results obtained.

STANDARD FORMS OF TABLES FOR RECORDING VITAL-STATISTICS DATA, RECOMMENDED BY THE SECTION
ON VITAL STATISTICS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

TABLE I.—Deaths (exclusive of stillbirths) from each cause, by sex and age: 19—

Int. Hist No.	Cause of death	All ages	Under 1 year	1	2	3	4	5-9	10- 14	15- 19	20- 24	25- 29	30- 34	35- 39	40- 44	45- 49	50- 54	55- 59	60- 64	65- 69	70- 74	75- 79	80- 84	85- 89	90- 94	95- 99	100 +	Unk
	All causes																											
	Males																											
	Females																											
	1. Epidemic, endemic, and infectious diseases																											
	Males																											
	Females																											
1	Typhoid and paratyphoid fever	{M F}																										
2	Typhus fever	{M F}																										
3	Relapsing fever (spirillum obermeieri)	{M F}																										
4	Malta fever	{M F}																										
5	Malaria	{M F}																										
6	Smallpox	{M F}																										
7	Measles	{M F}																										
8	Scarlet fever	{M F}																										
	Etc.																											

Causes which show no deaths for the year may be omitted.)

TABLE II.—Cases of and deaths by diseases dangerous to the public health, 19—

This table includes ALL cases (with their deaths) irrespective of whether cases were transported into the city from elsewhere or were contracted outside of the city

Int. List No.	Cause of death	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Total-----	{Cases----- Deaths-----												
1	Typhoid fever--	{Cases----- Deaths-----												
6	Smallpox-----	{Cases----- Deaths-----												
7	Measles-----	{Cases----- Deaths-----												
8	Scarlet fever--	{Cases----- Deaths-----												
9	Whooping cough	{Cases----- Deaths-----												
10	Diphtheria-----	{Cases----- Deaths-----												
22	Acute anterior polio-	{Cases----- Deaths-----												
23	myelitis-----	{Cases----- Deaths-----												
23	Lethargic en-	{Cases----- Deaths-----												
31	cephalitis-----	{Cases----- Deaths-----												
31	Tuberculosis, re-	{Cases----- Deaths-----												
32	spiratory sys-	{Cases----- Deaths-----												
32	tem-----	{Cases----- Deaths-----												
32	Tuberculosis of	{Cases----- Deaths-----												
33-37	meninges, etc.	{Cases----- Deaths-----												
33-37	Other forms of	{Cases----- Deaths-----												
40	tuberculosis-----	{Cases----- Deaths-----												
40	Ophthalmia ne-	{Cases----- Deaths-----												
(part)	onatorum-----	{Cases----- Deaths-----												

fant mortality: 19—[illegible]

IV. CONTROL OF COMMUNICABLE DISEASES

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With the exception of registration of births, deaths, and sickness and the function of sanitary supervision, no activity of health departments has been so universally recognized as exclusively a public function as that of control of communicable diseases.¹ Private health agencies do not share in this highly technical service, unless we except the use of funds, as in New York City, given by the American Red Cross for the promotion of diphtheria immunization. However, in this instance and in some other similar situations, although financial assistance has been given, the contact with the public, the service to the individuals, and the responsibility have been solely those of the health officer and his representatives, the credit for education and for actual administration of tests and preventive treatment being properly given to the public and not the private agency.

The only private agency which inevitably contributes by the very nature of its work to the prevention and control of communicable diseases is the visiting nurse service, even where under a curiously mistaken policy the city health officer forbids the visiting of cases of scarlet fever, diphtheria, and measles by any nurses except those who are the official agents of the health department.

Being a long-accepted and technical service, depending for its results upon a combined use of clinical, bacteriological, and epidemiological experience, it would be expected that a considerable degree of uniformity in practice and unanimity of opinion as to essentials would prevail among health officers and be expressed in regulations. However, as was found in the 1920 study, there is wide variation in the application in practice of much, and thoroughly well tested, medical information.

In this as in the previous report no attempt will be made to give all the material collected from the cities, but everything which appears to be reliable and relevant will be offered, together with such summary statements and tables as seem to express correctly the gist of the situation in regard to procedure in the more important notifiable diseases.

¹ For the purpose of the present discussion the control of tuberculosis is considered as a separate activity, to be treated in the following chapter.

ORGANIZATION

In the large cities of the first group the major subdivision of the health department devoted to control of communicable diseases, whether bureau or division, is, with the exception of Philadelphia, Baltimore, and Buffalo, in charge of a whole-time chief, the same variations in designation and combination of this function with other departmental activities existing in 1924 as in 1920. The salary range in the first group² extends from \$6,000 in Detroit to \$3,000 in San Francisco, for whole-time chiefs (in the latter instance the chief being a clerical and not a medical officer), and for part-time chiefs from \$4,600 in Philadelphia to \$4,500 in Buffalo and \$3,000 in Baltimore. In Los Angeles the assistant health officer is the chief of this bureau.

Among the cities of the second group, only Cincinnati, Denver, Minneapolis, Rochester, and Seattle do not set aside a separate bureau or division for this function. Only in Columbus and Rochester is the chief of the service not on a whole-time basis. The health officer himself is directly responsible for communicable disease control work in Minneapolis, Columbus, Denver, Indianapolis, Jersey City, Kansas City, Mo., and Seattle, and the assistant health officer is in charge in Louisville, Portland, and Rochester. The salaries in these cities of the second group are from \$4,500 in Jersey City to \$2,000 in Louisville for whole-time and from \$4,200 in Columbus to \$900 in Newark for part-time chiefs.

In 40 cities of the third group the chief of this service is a physician; in one instance (Jacksonville) a nurse is in charge. The cities with whole-time chiefs are Akron, Atlanta, Birmingham, Bridgeport, Dallas, Erie, Flint, Jacksonville, Houston, Lowell, New Haven, Norfolk, Paterson, Richmond, and Spokane; with the exception of six cities (Camden, Des Moines, Elizabeth, Hartford, where the health officer carried this function, Kansas City, Kan., and Reading) from which the information was not obtained. The others of this group had part-time chiefs. The salaries run for full-time medical chiefs from \$4,000 (Akron) to \$1,620 (Houston), the nurse in charge receiving \$1,800 in Jacksonville. For part-time chiefs the salaries are reported as \$4,500 at Worcester at the head of the list and \$1,200 at the bottom (Fort Worth, Salt Lake City, and Wilmington).

Among the cities of the fourth group, in 12 the service is directly under the health officer, in one under the assistant health officer (St. Joseph), in one under the division of sanitation (Allentown), in one under the school board (Wilkes-Barre), and in Waterbury,

² The entire group of 100 cities surveyed in 1924 has been divided into four groups, according to population. The arrangement of cities in these groups will be found on page 90 of this report.

Conn., under the nurses. In two cities, Savannah and San Diego, a part-time physician is in charge. Information as to salaries is lacking, except for Savannah (\$4,800 part-time), Manchester (\$3,600 health officer), St. Joseph (\$1,500 assistant health officer part-time). It is obvious that the reason for lack of specific data as to salaries is that the health officer who commonly carries this work in these cities can not state accurately what part of his time and salary should be allocated to the function of communicable disease control.

The excellence of communicable disease control in some cities (Rochester, N. Y.) where there is no separate chief and division, and the good standard practice often found where part-time direction prevails, make it evident in this as in other functions of health departments that it is not alone the form of organization or the money invested which determines good results.

The whole time of a trained epidemiologist or clinician with administrative experience is fully justified as chief of a bureau of communicable diseases and at a salary but little less than that of the health officer, to serve any community of 250,000–500,000 population or over, and by judicious combination of duties similarly in cities of over 100,000, while in smaller communities it should suffice if the health officer himself retains this as perhaps his most important duty.

FIELD FORCE

The three types of employees engaged in field work, medical inspectors or diagnosticians, nurses, lay sanitary inspectors, police or quarantine officers, are distributed about as described in the previous report. The change such as it is tends to be toward using the nurse, either of the health department or of the private agency, to make follow-up calls on suspect, contact or quarantined cases, to carry instructions and education and look for new cases among neighbors, the lay inspectors being used only for placarding and issuing release notices, physicians being almost universally reserved for the function of establishing or correcting the diagnosis in suspected or reported patients, and to give signed permission for return to school or to work. Physicians are, of course, used widely in immunizing, in testing for immunity, and in deciding for or against admission to hospital.

In all cities of the first group, physicians are used for diagnostic and release work, and for investigation of doubtful cases. Nurses are employed in instructive and supervisory control in all cities except Los Angeles, Philadelphia, Pittsburgh, St. Louis, and San Francisco. Lay sanitary officers are not employed in Baltimore, Boston, Buffalo, Cleveland, Detroit, New York City, Philadelphia, Pittsburgh and San Francisco for communicable disease control.

In cities of the second group, physicians are used except in Kansas City, Mo., Minneapolis, and Toledo. Nurses are not used in Denver, Indianapolis, Newark, Seattle, and Washington. Lay sanitary officers are not used in Cincinnati, Jersey City, Louisville, Minneapolis, New Orleans, Portland, Toledo and Washington.

Among the cities of the third group, only in Atlanta, Birmingham, Bridgeport, Erie, Fall River, Jacksonville, Lynn, and Utica is no physician employed in field work. Nurses are used except in Akron, Albany, Duluth, Elizabeth, Erie, Fort Worth, Grand Rapids, Lowell, New Bedford, Paterson, St. Paul, Salt Lake City, Spokane, Springfield, Tacoma, Tulsa, Wilmington and Youngstown. Twenty-five cities use lay sanitary officers, the following 25 cities not using them in the work of communicable disease control: Albany, Bridgeport, Cambridge, Camden, Dallas, Des Moines, Flint, Hartford, Lynn, Memphis, New Bedford, Norfolk, Oklahoma City, Omaha, Paterson, Providence, Richmond, St. Paul, Scranton, Spokane, Syracuse, Utica, Worcester, Yonkers, and Youngstown.

In cities of the fourth group physicians are used except in Schenectady, Waterbury, and Wilkes-Barre. Nurses are used in all cities except Fort Wayne, Manchester, Peoria, St. Joseph, South Bend, and Wilkes-Barre. Sanitary officers are used in all except Bayonne, Canton, El Paso, Evansville, Fort Wayne, Harrisburg, Peoria, San Diego, Savannah, Schenectady, Somerville, South Bend and Waterbury.

RELATION OF STATE DEPARTMENT TO LOCAL DISEASE CONTROL

At the request of a city for aid and advice, or on the initiative of the State department of health, when local service is considered unsafe or unwise in the interest of those elsewhere in the State or in neighboring States, the State department of health may assume direction of municipal communicable-disease control. It is generally appreciated that local responsibility and the quality of local municipal health work is better when the independence of administration of this fundamental civic function is jealously guarded and the health officer proves himself competent by results which give no excuse for State interference. The smaller the city, the more valuable and more often used are the services of the State through epidemiological and statistical reports, laboratory diagnosis, and expert supervision by some district officer whose area includes the city.

EXPENDITURES FOR COMMUNICABLE-DISEASE CONTROL

The amount reported to be spent for control of communicable diseases in 1923 was \$2,632,484.12 for 98 cities (Manchester and

Wilkes-Barre omitted) which amounts to 8.2 cents per capita for the 31,997,454 population served. While inaccuracies and incompletenesses of statement have crept into the reports, pains have been taken to exclude from this cost the expense of hospitalization of patients and the value of time spent by field workers or others in functions which did not primarily concern control of communicable disease. Where the cost is reported as being very low, it is commonly found that a private nursing agency or perhaps police patrolmen or representatives of the school health service do much of the work properly considered the function of a fully developed bureau or division of communicable disease, and of the monetary value of these services we have no estimates or record to offer.

In favor of the approximate accuracy of the per capita cost of this service it is to be noted that 8 cents was the average among 63 cities in 1920, while the comparable figure for 98 cities in 1923 is only two-tenths of a cent higher.

This represents almost exactly 10.7 per cent of the total cost of health services in these 98 cities (exclusive of all hospitalization costs), as compared with 15 per cent in 1920 among 63 cities.

A city with a well-developed and well-balanced program and service for health protection may show a very low per cent of its total costs under the function of communicable-disease control and still be doing a high-grade and adequate piece of work, while a department starved and lacking initiative or capacity may, for the very reason that control of communicable disease is generally understood and reasonably well provided for, appear to be undertaking a very elaborate and thoroughly generous job in this field. For these and other reasons the following general summary of range of per cent of total expenditure chargeable to communicable-disease control must not be considered as implying merit or blame, on the basis of relative functional costs. It will be observed later that per capita costs vary much less than per cent of total expenditure.

It would appear from the changes in average per capita cost in each of the four groups of cities; taken together with a reduction of one-third in the relative amount paid for this function in proportion to the total cost of health work, that as broader health activities are undertaken generally in our cities, more nearly adequate and uniform provision is made for such essential and well-established functions as that of communicable-disease control.

Of the first group cities St. Louis alone exceeds a per capita expenditure for communicable disease control of 12 cents with \$0.123, no city spending so little as \$0.03 per capita. However, of this group, three cities devote more than 20 per cent of their total

health expenditures to this function—Boston 25.7, Philadelphia 22.5, St. Louis 35.5, while Buffalo 4.4, Pittsburgh 3.0 and San Francisco 2.7 per cent, spend less than 5 per cent of their total health budget for this purpose.

Of the second group cities, Jersey City \$0.254, New Orleans \$0.124, and Toledo \$0.138, spend more than 12 cents per capita for communicable disease control, while Rochester, \$0.026, alone spends less than 3 cents. Five of this group devote more than 20 per cent of their total health expenditures to this function—Jersey City 26.4, Minneapolis 21.5, New Orleans 22.7, Toledo 37.3, and Washington 25.1 per cent, while Rochester 3.1, and Seattle 1.6 per cent, spend less than 5 per cent of their total health costs for this purpose.

Of the third group of cities, Dallas \$0.138, Fall River \$0.194, Lowell \$0.215, and St. Paul \$0.132, spend more than 12 cents per capita, while Atlanta \$0.025, Fort Worth \$0.023, Lynn \$0.023, Omaha \$0.027, Paterson \$0.014, Salt Lake City \$0.024, Scranton \$0.019, Springfield \$0.012, Tacoma \$0.017, Worcester \$0.015, and Youngstown \$0.013, spend less than 3 cents per capita. Expressed in percentage of total health expenditures, we find that Dayton 40.4, Kansas City, Kans., 29.9, St. Paul 23, and Wilmington 42.2 per cent, all spend more than 20 per cent of their health budget for communicable disease control, while 14 cities devote less than 5 per cent of their health expenses to this purpose—Bridgeport 4.0, Grand Rapids 2.4, Hartford 3.9, Lynn 1.9, New Bedford 3.3, Omaha 3.2, Paterson 2.1, Salt Lake City 2.9, Springfield 1.3, Syracuse 4.3, Tacoma 3.6, Tulsa 4.1, Worcester 3.4, and Youngstown 4.8 per cent.

Of the fourth group cities, no city spends more than 12 cents per capita for communicable disease control, while Evansville \$0.026, St. Joseph \$0.019, Schenectady \$0.022, and Sioux City \$0.019, spend less than 3 cents per capita.

Those which devote more than 20 per cent of their expenses to communicable disease control are Canton 26.2, Fort Wayne 20.9, Harrisburg 38.6, and South Bend 24.8 per cent, while Lawrence 2.7, Schenectady 3.2, and San Diego 3.7 per cent, use less than 5 per cent of their health expenses for this purpose.

The average per capita cost of communicable disease control was:

For the first group cities_____	\$0. 092
For the second group cities_____	. 083
For the third group cities_____	. 065
For the fourth group cities_____	. 055

in each instance a little more than was spent in the groups in 1920, when the per capita costs were for the first group \$0.084, second group \$0.083, third group \$0.06.

TABLE I.—The cost of communicable-disease control, expressed in terms of cents per capita of population of each city and in percentage of the total expenditure for health purposes in 98 cities, 1923

	Expended for communi- cable disease				Expended for communi- cable disease		
	Amount	Per capita	Per cent of total		Amount	Per capita	Per cent of total
GROUP I				GROUP III—Continued			
Baltimore.....	\$83,027.10	0.107	13.7	Kansas City, Kans.....	\$10,300.00	0.089	29.9
Boston.....	131,419.93	.171	25.7	Lowell.....	24,794.36	.215	13.9
Buffalo.....	17,175.90	.032	4.4	Lynn.....	2,337.33	.023	1.9
Chicago.....	187,228.86	.065	¹ 11.9	Memphis.....	12,075.69	.071	10.9
Cleveland.....	84,626.97	.095	18.4	Nashville.....	12,500.00	.103	18.7
Detroit.....	112,900.00	.113	² 13.6	New Bedford.....	6,389.86	.049	3.3
Los Angeles.....	35,763.78	.053	9.5	New Haven.....	15,575.00	.090	16.2
New York.....	619,566.36	.103	11.9	Norfolk.....	11,155.00	.070	8.2
Philadelphia.....	145,709.85	.076	22.5	Oakland.....	9,536.00	.040	7.9
Pittsburgh.....	63,163.88	.102	3.0	Oklahoma City.....	6,600.00	.065	5.5
St. Louis.....	99,254.00	.123	35.5	Omaha.....	5,520.00	.027	3.2
San Francisco.....	17,248.28	.032	³ 2.7	Paterson.....	1,950.00	.014	2.1
GROUP II				Providence.....	12,617.12	.052	6.9
Cincinnati.....	18,000.00	.044	13.4	Reading.....	5,895.00	.053	11.6
Columbus.....	25,413.04	.097	18.3	Richmond.....	12,204.00	.067	10.9
Denver.....	14,830.00	.055	12.8	St. Paul.....	31,945.75	.132	23.0
Indianapolis.....	23,108.79	.067	⁴ 14.3	Salt Lake City.....	3,000.00	.024	2.9
Jersey City.....	78,400.00	.254	⁵ 26.4	San Antonio.....	6,960.15	.038	¹⁰ 11.1
Kansas City, Mo.....	27,492.58	.078	8.3	Scranton.....	2,640.00	.019	7.2
Louisville.....	12,245.00	.047	14.1	Spokane.....	5,312.81	.051	8.0
Milwaukee.....	29,630.24	.061	6.7	Springfield.....	1,672.49	.012	1.3
Minneapolis.....	24,071.43	.059	21.5	Syracuse.....	7,700.00	.042	4.3
Newark.....	30,251.25	.069	9.3	Tacoma.....	1,680.00	.017	3.6
New Orleans.....	50,026.12	.124	22.7	Trenton.....	4,500.00	.035	7.4
Portland.....	12,131.99	.044	10.4	Tulsa.....	4,000.00	.039	¹¹ 4.1
Rochester.....	8,119.02	.026	3.1	Utica.....	8,170.00	.077	¹² 18.7
Seattle.....	14,811.15	.047	1.6	Wilmington.....	9,065.85	.077	¹³ 42.2
Toledo.....	36,900.00	.138	⁶ 37.3	Worcester.....	2,879.37	.015	¹⁴ 3.4
Washington.....	55,710.00	.117	25.1	Yonkers.....	6,308.33	.059	¹⁵ 5.9
GROUP III				Youngstown.....	2,012.50	.013	¹⁶ 4.8
Akron.....	24,010.00	.115	17.5	GROUP IV ¹⁷			
Albany.....	11,000.00	.094	⁷ 13.4	Allentown.....	3,379.12	.039	6.8
Atlanta.....	5,624.00	.025	5.7	Bayonne.....	3,846.21	.046	17.1
Birmingham.....	6,900.00	.035	9.6	Canton.....	8,430.00	.085	26.2
Bridgeport.....	13,600.00	.095	4.0	El Paso.....	5,667.00	.059	8.8
Cambridge.....	8,921.20	.080	5.9	Evansville.....	2,400.00	.026	6.1
Camden.....	6,000.00	.048	6.6	Fort Wayne.....	5,000.00	.053	20.9
Dallas.....	25,180.53	.138	18.5	Harrisburg.....	9,412.11	.116	38.6
Dayton.....	30,830.00	.186	40.4	Knoxville.....	5,020.00	.057	16.6
Des Moines.....	4,578.32	.032	9.0	Lawrence.....	9,925.38	.102	2.7
Duluth.....	7,300.00	.069	7.2	Peoria.....	2,872.52	.036	¹⁸ 12.4
Elizabeth.....	7,245.00	.070	11.7	St. Joseph.....	1,500.00	.019	5.0
Erie.....	6,645.00	.059	14.8	San Diego.....	2,656.45	.030	3.7
Fall River.....	23,500.00	.194	15.6	Savannah.....	5,440.77	.061	6.1
Flint.....	11,340.26	.096	14.8	Schenectady.....	2,125.00	.022	3.2
Fort Worth.....	3,290.00	.023	17.4	Sioux City.....	1,500.00	.019	11.5
Grand Rapids.....	5,138.00	.035	⁸ 2.4	Somerville.....	5,750.00	.058	11.4
Hartford.....	5,751.20	.038	⁹ 3.9	South Bend.....	6,183.17	.080	24.8
Houston.....	11,157.30	.072	11.6	Troy.....	4,200.00	.058	12.0
Jacksonville.....	11,561.48	.116	10.5	Waterbury.....	8,350.00	.085	9.8
				Wichita.....	3,681.97	.046	6.1

¹ Total used was \$1,569,979.03.

² \$828,808.

³ \$648,329.82 as total.

⁴ \$161,177.33 as total.

⁵ \$296,423 as total.

⁶ \$98,855.32 as total.

⁷ Budget only.

⁸ \$210,232.22.

⁹ \$147,047.08.

¹⁰ \$62,828.31 as total.

¹¹ \$98,075 as total.

¹² \$43,722 as total.

¹³ \$21,483.85 as total.

¹⁴ \$85,736.91 as total.

¹⁵ \$107,611.90 as total.

¹⁶ \$41,912.14 as total.

¹⁷ Manchester and Wilkes-Barre omitted.

¹⁸ \$23,233.42 as total.

GENERAL PROCEDURE IN COMMUNICABLE DISEASE CONTROL

1. NOTIFICATION

Notification of diagnosis together with the name, age, sex, and address of the patient is the minimum acceptable information for any reliable system for the control of communicable disease. The measure of success of educational and administrative efforts is to be found in the completeness, accuracy, and promptness with which recognized and suspected cases of notifiable infections are reported by physicians or others. Variation in the diseases for which reports are called for are slight and unimportant, except where for local or climatic conditions or because of some temporary excess prevalence, a particular additional disease is made reportable.

Among the first group of cities there are no exceptions to the requirement of reporting the usual list of communicable diseases (typhoid, scarlet fever, diphtheria, measles, mumps, whooping cough, smallpox, chicken pox, meningococcus meningitis, poliomyelitis, influenza, and pneumonia). Malaria is not recorded as reportable in the answers to the direct question, but in the returns of cases and deaths it is usually found that it is considered as reportable. No information upon hookworm infection is provided from any city. Similarly we have no facts concerning infectious conjunctivitis or ophthalmia neonatorum although this condition is almost universally reportable to municipal departments of health.

Among the second group cities Cincinnati and New Orleans do not require reporting of chicken pox.

Among the third group cities we have no record as to the practice in regard to chicken pox from Atlanta, Dayton, or Providence.

Of the fourth group cities Bayonne does not require reporting of chicken pox.

In cities of the first group reporting is accepted by telephone or card in all except St. Louis and Baltimore where a card is required. Notification is considered to have been made if a laboratory specimen, as of diphtheria smear, determines a positive diagnosis, in New York, Boston, Cleveland, and San Francisco.

In cities of the second group notification by card or telephone is accepted, except that in Indianapolis telephone report alone suffices, and in Newark and Washington only the card is accepted. In Cincinnati, Columbus, Milwaukee, and New Orleans, report by a laboratory diagnosis is accepted.

In cities of the third group only in the cases of Flint, Fort Worth, New Haven, San Antonio, and Scranton is notification by telephone alone accepted. In other cities report may be sent by card or telephone. Report by means of a positive laboratory specimen is accepted in Camden, Dayton, Elizabeth, Fall River, Flint, Houston,

Lawrence, Lowell, Memphis, New Haven, New Bedford, Reading, Somerville, Springfield, Wilmington, and Yonkers.

In cities of the fourth group card notification is required except in Allentown, Fort Wayne, Manchester, and Peoria, where a telephone report is accepted. In Harrisburg, the telephone report is not accepted. Other channels of notification, as by laboratory report, are accepted in Allentown, Bayonne, Manchester, Peoria, Savannah, St. Joseph, Schenectady, South Bend, Troy, and Wilkes-Barre.

Estimates of completeness of notification even in the major communicable diseases exclusive of measles, mumps, and whooping cough, are of little value, but the following information is offered to indicate the degree of variation and the impracticability of deducing any reliable data from the personal opinions of health officers in such matters.

In the first group cities no estimate was offered except as follows:

	Per cent		Per cent
Boston	86-90	Philadelphia (complete)	100
Cleveland	50	San Francisco	90

In the second group cities estimates were offered only from the following cities:

	Per cent		Per cent
Denver	85	Milwaukee	95
Indianapolis	100	Newark	95-98
Jersey City	90	Portland	50
Kansas City, Mo.	80	Seattle	85
Louisville	90	Toledo	95

In the third group cities estimates are offered as follows:

	Per cent		Per cent
Cambridge	90	Omaha	100
Dallas	80-90	Paterson	80
Duluth	90	Providence	100
Elizabeth	100	Reading	95
Fall River	100	Richmond	75
Hartford	100	St. Paul	95
Houston	95	Salt Lake City	90
Kansas City, Kans.	95	Spokane	98
Lowell	50	Springfield	90
New Haven	90-95	Tacoma	80
Oakland	80-90	Wilmington	75-95
Oklahoma City	100	Yonkers	90

In the fourth group estimates were:

	Per cent		Per cent
Allentown	95	St. Joseph	50
Evansville	85	San Diego	65-100
Knoxville	70	Schenectady	95
Lawrence	28	Sioux City	95
Manchester	14	Somerville	100

In answering the query as to probable per cent of cases reported, the distinction is made between the major reportable diseases, i. e., those for which isolation is enforced and those for which no placarding or any effective precautions are taken, as for instance in Savannah it is thought that 95 per cent of the cases of typhoid fever are reported but only 50 per cent of the measles.

It is pretty generally admitted that not more than half of the cases of measles and whooping cough are reported while most of the answers indicate a faith that over 85 per cent of the typhoid, scarlet fever, and diphtheria cases are reported. As a means of testing the reliability of such estimates of accuracy, the reports of cases and deaths from typhoid fever may again serve, as in the 1920 report, to gauge practice.

Among the 100 cities, 6,744 cases and 1,157 deaths from typhoid fever were reported during the year 1923 (5.82 cases for each death). Analyzing these by city groups, we find in the first group 2,771 cases and 451 deaths (6.14 to 1); in the second group 1,035 cases and 205 deaths (5.05 to 1); in the third group 2,025 cases and 338 deaths (5.99 to 1); in the fourth group 913 cases and 163 deaths (5.60 to 1). In the first group, Boston has the high ratio of 120 cases to 10 deaths, Philadelphia has 271 cases and 29 deaths, Chicago 473 cases with 57 deaths, while Buffalo had 56 cases and 22 deaths, and Detroit 134 cases with 42 deaths.

In the second group the high ratios are found in Louisville with 127 cases to 11 deaths, Minneapolis 65 cases and 8 deaths, and Newark 66 cases and 11 deaths, while the low ratio cities were Columbus, 42 cases and 12 deaths, and Kansas City, Mo., 48 cases and 18 deaths.

In the third-group cities, which, as a group, show the most nearly complete reporting, we find 11 cities with 10 or more cases reported for each death from typhoid fever—Albany 15, Bridgeport 17, Elizabeth 22, Fall River 11, Grand Rapids 16, Kansas City, Kans. 30, Memphis 10, Norfolk 10, Utica 10 (no death), Wilmington 11.7, Yonkers 13—and there were 19 other cities reporting 6 or more but not up to 10 cases per death. The cities with low ratios were Atlanta 1.7, Houston 3, Lowell 3.3, Oakland 3.3, and San Antonio 3.4.

In the fourth-group cities the high ratios were in Harrisburg 12, Lawrence 9.5, Sioux City 8.5, and low ratios in Bayonne 2.5, South Bend 3.3, Wichita 3.5 cases for each death.

While in 1920 the experience of 79 cities showed a ratio of 6.1 cases to each death reported, a lower ratio of 5.82 prevailed among 99 in 1923 (Peoria not reporting). From the experience of the third-group cities it is obvious that the arbitrary ratio of 10 cases to a death is not too high to expect and that in all probability there are commonly to be found, if diligently sought for, as many as twenty cases for every death.

TABLE IV.—Number of cases, and deaths reported by the health departments in 100 cities (1923) for certain diseases, and probable per cent of all cases reported

Cases and deaths reported														
	Model law for morbidity reports used	Probable per cent cases reported	Typhoid		Diphtheria		Scarlet fever		Tuberculosis (pulmonary)		Measles		Whooping cough	
			Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
GROUP I														
	Baltimore	City card	209	32	1,318	90	2,238	23	1,482	899	8,289	56	3,090	100
	Boston	No.	120	10	3,257	173	3,211	58	1,683	677	5,023	57	2,034	109
	Buffalo	No.	56	22	686	56	1,227	28	862	464	5,527	71	1,098	45
	Chicago	Yes	473	57	5,836	365	3,529	84	10,105	2,008	15,168	206	3,426	137
	Cleveland	State code	114	16	1,621	114	3,653	58	1,964	750	6,411	29	1,629	34
	Detroit	Practically	134	42	2,424	205	4,162	86	2,234	855	4,597	85	2,745	82
	Los Angeles	Yes	171	25	2,907	105	1,603	18	13,195	1,061	3,688	18	4,445	35
	New York	Yes	890	140	8,050	554	8,237	107	11,336	4,951	13,999	245	4,484	202
	Philadelphia	No.	271	29	3,310	270	2,233	34	3,674	2,122	7,997	223	2,457	103
Pittsburgh	Yes	81	23	1,427	159	1,350	113	744	464	7,662	118	1,253	42	
St. Louis	Yes	179	38	2,920	2120	1,228	33	1,802	594	203	2	1,464	39	
San Francisco	Yes	73	17	1,708	148	897	12	1,230	561	3,908	21	482	28	
Total		2,771	451	35,464	2,359	33,568	654	337,116	314,345	82,472	1,131	24,607	956	
GROUP II														
	Cincinnati	Yes	62	12	575	22	596	18	879	458	1,410	19	728	18
	Columbus	State code	42	12	381	17	337	4	294	213	2,148	28	308	37
	Denver	Yes	72	14	1,357	79	705	3	343	519	4,052	36	882	32
	Indianapolis	Yes	42	10	680	45	167	2	375	310	6,750	26	1,431	37
	Jersey City	Yes	28	5	483	34	420	16	481	280	487	16	71	26
	Kansas City, Mo.	Yes	48	18	514	38	495	7	481	275	3,309	54	649	26
	Louisville	Yes	127	11	432	19	110	0	807	275	809	1	466	18
	Milwaukee	Yes	26	4	1,043	101	4,973	71	667	298	4,819	7	1,357	9
	Minneapolis	Yes	65	8	1,275	50	1,709	34	1,159	260	1,091	15	125	24
Newark	City code	66	11	634	34	596	5	1,129	406	4,680	41	1,124	19	

New Orleans	No.	Typhoid 85 to 90 per cent, diphtheria 85 to 90 per cent, scarlet fever 75 per cent, others less than 30 per cent. 50 per cent.	170	37	693	32	190	4	1,011	632	410	33	314	52
Portland, Oreg	Yes		30	6	428	28	267	1	367	144	1,715	2	236	12
Rochester	No.		40	7	371	35	227	5	664	209	1,826	31	404	22
Seattle	No.		44	8	296	19	454	6	766	138	2,321	5	925	13
Toledo	Yes		60	15	721	64	1,208	17			3,128	25	516	8
Washington	No.		113	27	565	42	998	11	1,210	506	7,610	34	1,393	34
Total			1,035	205	10,448	659	13,452	204	10,152	4,923	46,565	373	10,929	387
GROUP III														
Akron	Yes	High, except tuberculosis, pneumonia, and whooping cough.	26	4	294	21	328	19	241	80	939	8	490	8
Albany	Yes		62	4	404	15	437	5	250	112	1,428	7	229	7
Atlanta	No.	Scarlet, diphtheria, fair; others, poor.	67	39	218	26	212	2	582	194	743	37	75	33
Birmingham	Yes; modified.	Practically all except measles and whooping cough.	136	15	216	13	105	2	521	214	2,481	30	301	37
Bridgeport	Yes	Greatly variable according to disease.	17	1	356	25	421	2	266	116	150	35		
Cambridge	Yes	About 90 per cent.	15	4	257	11	508	3	171	113	1,243	7	1,050	16
Camden	Yes	do	28	5	536	38	79	0	165	135	1,464	23	66	4
Dallas	No.	Probably 80 to 90 per cent.	129	15	327	14	159	2	50	69	1,999	3	852	16
Dayton	Yes	Probably fair.	28	4	276	10	440	7	115	79	1,480	13	71	24
Des Moines	Yes	Quarantined cases very high. Placarded 50 per cent; others very small.	12	2	484	24	906	9	10	57	8	1	3	2
Duluth	Yes	90 per cent.	21	3	142	7	409	0	164	45	1,751	2	240	1
Elizabeth	Practically the same.	Major diseases, 100 per cent. Home treatment not reported.	22	1	529	27	244	2	123	50	996	11	251	13
Erie	No.	Diphtheria and scarlet fever about 90 per cent.	22	3	196	14	355	8	234	86	1,846	11	582	14
Fall River	No.	Diphtheria and scarlet fever, 100 per cent; others less than 50 per cent.	45	4	332	53	165	4	201	111	1,248	53	88	16
Flint	Yes		23	4	573	56	385	8	198	44	1,032	4	356	2
Fort Worth	No.	Probably very small.	37	8	139	4	65	1	70	31	81	0	6	4
Grand Rapids	No.	Practically all important diseases. About 50 per cent of others.	33	2	308	13	428	3	205	57	3,101	3	527	8
Hartford	No.	Practically 100 per cent.	7	1	374	18	240	1	5230	5108	67	1	288	10
Houston	State code.	95 per cent.	36	12	164	9	105	0	175	177	22	0	10	4
Jacksonville	Yes	Average.	52	14	83	19	11	1	251	167	1,181	6	225	4
Kansas City, Kans.	Yes	95 per cent.	30	1	133	3	210	0	257	121	2,414	2	447	4
Lowell	No.	95 per cent.	10	3	120	14	227	4	150	76	1,324	12	197	12
Lynn	Yes	About 50 per cent.	17	3	148	9	260	1	139	65	1,113	12	227	15
Memphis	No.	Typhoid 98 per cent, scarlet fever 95, Diphtheria 75, tuberculosis, measles, and whooping cough, 50 per cent.	240	24	281	11	161	3	560	233	3,634	23	389	7
Nashville	No. More complete.		93	12	79	5	98	3	225	152	2,686	60	131	16
New Bedford	Yes		5	1	115	9	78	3	210	95	1,804	4	191	2

¹ All forms.² Includes croup.³ Total cases and deaths for tuberculosis, pulmonary, Group I, omitting Los Angeles.⁴ Includes laryngeal.⁵ Includes 39 deaths of residents occurring outside city.⁶ New cases, 225; active cases, 750.

GROUP IV																	
Allentown	Yes	95 per cent, except tuberculosis and venereal diseases.	27	5	229	13	197	4	68	74	1,633	6	100	0			
Bayonne	Yes	Typhoid, diphtheria, scarlet fever, 60 per cent. Other, 20 per cent.	5	2	121	10	63	1	140	47	12	0	10	4			
Canton	Yes	Quarantine cases, very good; others very poor.	10	2	376	17	101	0	23	51	293	1	207	2			
El Paso	No law	Varies with disease.	56	12	58	8	78	1	608	413	1,638	50	638	51			
Evansville	Yes	85 per cent in serious diseases	17	4													
Fort Wayne	Yes	95 per cent	197	27	241	9	191	2	43	41	849	6	185	1			
Harrisburg	No	Good except tuberculosis very poor	12	1	101	4	193	1	37	56	2,370	7	345	4			
Knoxville	(?)	About 70 per cent	67	12	47	7	105	3	123	104	773	14	8	7			
Lawrence	No	About 28 to 30 per cent.	38	4	225	25	36	1	80	56	523	10	258	10			
Manchester	No	13 to 14 per cent.	8	2	188	15	39	1	131	44	148	8	39	13			
Peoria		Thought to be very high	(⁹)														
St. Joseph	Yes	About 50 per cent	5	0	84	5	109	0	63	39	664	1	84	4			
San Diego	Yes	Varies, 65 to 100 per cent	8	1	219	10	250	6	212	120	1,648	1	908	20			
Savannah	No	Typhoid, 95 per cent; measles, 50 per cent.	338	64	531	45	231	4	106	746	515	19	99	33			
Schenectady	Yes	95 per cent	7	1	283	12	315	5	135	146	1,006		265	5			
Sioux City	No	do.	17	2	203	15	133	2	150	121	876	2	76	4			
Somerville	Yes	Major diseases, 100 per cent; minor, 50 per cent.	18	4	177	19	201	3	98	32	813	2	136	5			
South Bend	Yes	No estimate	10	3	213	16	321	6	119	43	388	7	78	7			
Troy	Yes		15	2	184	11	29	0	166	51	729	2	112	1			
Waterbury	Yes	Good	8	1	319	20	484	8	117	45	667	29	73	8			
Wichita	Yes	Major diseases good; minor, poor	39	11	297	7	110	2	25	26	466	1	124	0			
Wilkes-Barre	Yes		11	3	141	10	61	0	40	51	282	1	206	0			
Total			913	163	4,237	278	3,247	50	2,384	2,106	16,293	167	3,951	179			
Totals, by groups:																	
Group I			2,771	451	35,464	2,359	33,568	654	40,311	15,406	82,472	1,131	24,607	956			
Group II			1,035	205	10,448	659	13,452	204	10,152	4,923	46,565	373	10,929	387			
Group III			2,025	338	15,021	1,055	14,762	231	9,238	5,394	69,363	770	13,419	534			
Group IV			913	163	4,237	278	3,247	50	2,384	2,106	16,293	167	3,951	179			
All cities			6,744	1,157	65,170	4,351	65,029	1,139	1062,085	1027,829	214,693	2,441	52,906	2,056			

¹ All forms.
⁷ Does not include 77 carriers.
⁸ Total cases and deaths for tuberculosis, pulmonary, Group III, omitting Camden, Fall River, Providence, and Richmond.
⁹ No data for Peoria.
¹⁰ Total cases and deaths for tuberculosis, pulmonary, Group IV, omitting Evansville, Peoria, Schenectady, and Sioux City.

Without attempting to develop any basis of good practice from the experience of the cities with the reporting of diphtheria, scarlet fever, measles, and whooping cough, the following summary statement of cases and deaths for all cities and for cities by groups may be of interest for future reference—

TABLE II.—Cases, deaths, and ratio of deaths to cases for diphtheria, scarlet fever, measles, and whooping cough in 100 cities, by groups

	Diphtheria			Scarlet fever			Measles			Whooping cough		
	Cases	Deaths	Ratio	Cases	Deaths	Ratio	Cases	Deaths	Ratio	Cases	Deaths	Ratio
All cities.....	65, 170	4, 351	1:15	65, 029	1, 139	1:58	214, 693	2, 441	1:88	52, 906	2, 056	1:26
Group I.....	35, 464	2, 359	1:15	33, 568	654	1:51	82, 472	1, 131	1:73	24, 607	956	1:26
Group II.....	10, 448	659	1:16	13, 452	204	1:66	46, 565	373	1:125	10, 929	387	1:28
Group III.....	15, 021	1, 055	1:14	14, 762	231	1:64	69, 363	770	1:91	13, 419	534	1:25
Group IV.....	4, 237	278	1:15	3, 247	50	1:65	16, 293	167	1:98	3, 951	179	1:22

By reference to the basic table (Table IV, pp. 94-97) giving cases and deaths reported, the wide range in ratios for these two items among the 100 cities is seen at a glance. Taking the first group cities as a sample the following table shows this variation in ratios of cases to deaths in diphtheria, scarlet fever, measles, and whooping cough:

TABLE III.—Number of cases reported for each death in certain diseases

	Diph-theria	Scarlet fever	Measles	Whoop-ing cough
Baltimore.....	15	97	148	31
Boston.....	19	55	88	19
Buffalo.....	12	44	78	24
Chicago.....	16	42	74	25
Cleveland.....	14	63	221	48
Detroit.....	12	48	54	33
Los Angeles.....	28	89	204	13
New York.....	15	77	57	22
Philadelphia.....	12	66	36	24
Pittsburgh.....	9	12	65	30
St. Louis.....	24	37	102	38
San Francisco.....	12	75	186	17

There is no information as to the permissible interval of time between discovery of a case or establishment of probable or positive diagnosis and the reporting of the case to the health authorities. Immediate reporting is presumed in all instances.

Of the first group, five cities do not follow the model morbidity law proposed by the American Public Health Association, Baltimore using a city code and Cleveland a State code, while Buffalo, Boston, and Philadelphia follow local regulations.

Of the second group, six cities do not use the model morbidity law—Columbus (State code), Newark (State code), New Orleans, Rochester, Seattle, and Washington.

Of the third group, 17 cities do not use the model law—Atlanta, Dallas, Erie, Fall River, Fort Worth, Grand Rapids, Hartford, Houston (State code), Lowell, Memphis, Norfolk, Providence, Reading, Richmond, San Antonio, Syracuse, and Wilmington.

Of the fourth group, six cities do not use the model law—El Paso, Harrisburg, Lawrence, Manchester, Savannah, and Sioux City.

For the cities of Knoxville, Peoria, St. Paul, and South Bend we have no information as to the character of the reporting law or ordinance.

In summary, 63 of the cities use the model morbidity law or its equivalent, 34 do not, and in 3 the practice is not reported.

2. INVESTIGATION OF CASES

Even when reporting is incomplete, as is shown to be so common, much can be done by prompt and effective investigation of those cases which are reported, in respect to contacts, probable source of infection, and relation to nonimmunes at home, in school, or at the place of work. The visit of investigation serves not only to confirm the isolation, to carry instructions, to verify the original report, but is the means by which current studies of disease prevalence are made more nearly correct.

First group of cities

Typhoid cases are visited in every instance (Cleveland, 46 per cent of cases)—in four cities by a physician only; in one city by a nurse only; in five cities by both physician and nurse; and in two cities by physician and sanitary officer.

Except in Pittsburgh, where 90 per cent of the cases of diphtheria are visited, it is reported that every case of this disease is visited by some representative of the health department—in four cities by a physician, in two by a nurse, in three by a physician and a nurse, in three by a physician and a lay inspector.

Scarlet fever cases are uniformly visited (Pittsburgh claims in 90 per cent)—in four cities by a physician, in two by a nurse, in three by a physician and a nurse, and in three by a physician and a lay inspector.

All cases of smallpox are visited in all cities—in eight by a physician, in two by a physician and a nurse, and in two by a physician and a lay inspector.

Cases of measles are not visited at all in Detroit and Los Angeles, only 10 per cent of them in Cleveland, and only "on request" in Pittsburgh. They are visited in two cities by a physician, in two by a physician and nurse, in three by a nurse, and in two by a lay inspector.

Cases of mumps are visited in no instance in Chicago, Detroit, Los Angeles, New York, and San Francisco, and only "on request" in Pittsburgh. In one city they are visited by a physician, by a nurse in four cities, and by a lay inspector in one.

Whooping cough is not visited in Los Angeles and San Francisco, and only "on request" in Pittsburgh. It is visited in one city by a physician, in six by a nurse, and in two by a lay inspector.

Chicken pox is not visited in New York; is visited only "on request" in Pittsburgh. It is visited in Detroit by a physician if 16 years or more of age; in Boston by a nurse in all cases, and by a physician if 16 years of age or is considered a suspicious case by the visiting nurse; by a physician in from 75 per cent to 100 per cent of cases in four cities; by a physician and nurse in two cities; by a nurse in two cities; by an inspector in one; and by a physician and inspector in one city.

Meningococcus meningitis is visited in 11 cities; in Pittsburgh "on request" only; by a physician in three cities; by a physician and nurse in three cities; by a physician and lay inspector in two cities; by a nurse in two cities; and by a lay inspector in one city.

Poliomyelitis is visited in 11 cities—in Pittsburgh "on request" only, by a physician in three, by a physician and nurse in two, by a physician and lay inspector in three, and by a nurse in three cities.

Influenza is reported to be visited in Boston by a physician and nurse, in Detroit by a nurse, in Chicago and St. Louis by a lay inspector, and not visited in the other eight cities.

Pneumonia is reported to be visited in Boston by a physician, in Chicago by a lay inspector, and not visited in the other 10 cities.

Limitation of space forbids discussing the practice of the other groups in the same detail but the practice of all cities, and of the second, third, and fourth groups together can be understood from the following table, although the procedure in the several cities separately is not identified.

TABLE V.—Practice in respect to visiting reported cases of certain diseases

	Number of cities in which reported cases are visited by—										
	Doctor	Nurse	Inspector	Doctor and nurse	Doctor and inspector	Nurse and inspector	Doctor, nurse, and inspector	Doctor or nurse	Doctor or inspector	Not visited	No information
ALL CITIES											
Typhoid fever.....	27	27	12	15	6	7	3	0	3	0	0
Diphtheria.....	27	24	9	14	6	13	3	1	3	0	0
Scarlet fever.....	25	21	16	16	7	9	1	1	3	0	1
Smallpox.....	51	7	7	14	12	3	1	0	3	0	2
Measles.....	9	23	25	8	1	7	0	1	3	21	2
Mumps.....	5	19	21	3	1	3	0	1	3	40	4
Whooping cough.....	10	25	21	3	1	8	0	1	2	27	2
Chicken pox.....	29	21	15	7	4	5	1	1	3	12	2
Meningitis.....	29	22	11	12	10	5	1	0	2	5	3
Poliomyelitis.....	28	22	8	12	11	7	2	0	1	7	2
Influenza.....	4	11	11	4	0	2	0	1	2	59	6
Pneumonia.....	2	11	5	1	2	0	0	0	0	72	7
CITIES IN GROUPS II, III, AND IV											
Typhoid fever.....	23	26	12	10	4	7	3	0	3	0	0
Diphtheria.....	23	22	9	11	3	13	3	1	3	0	0
Scarlet fever.....	21	19	16	13	4	9	1	1	3	0	1
Smallpox.....	43	7	7	12	10	3	1	0	3	0	2
Measles.....	7	20	23	6	1	7	0	1	3	19	1
Mumps.....	4	15	20	3	1	3	0	1	3	35	3
Whooping cough.....	9	19	19	3	1	8	0	1	2	25	1
Chicken pox.....	25	19	14	5	3	5	1	1	3	11	1
Meningitis.....	26	19	10	10	8	5	1	0	2	5	2
Poliomyelitis.....	25	19	8	10	8	7	2	0	1	7	1
Influenza.....	4	10	9	3	0	2	0	1	2	51	6
Pneumonia.....	1	11	4	1	2	0	0	0	0	62	7

3. VERIFICATION OF DIAGNOSIS

The precautions taken by the health departments of cities to verify or correct a diagnosis before putting into effect any restrictions of isolation or quarantine are either through laboratory examinations, by clinical observation of the patient, or by both means. The facts assembled in Table VI can be expressed briefly as follows for the various diseases by groups of cities.

In typhoid fever all cities of the first group verify by laboratory methods and in addition by clinical means in four instances; in the second group, one city makes no verification (Washington, D. C.), 10 use laboratory means alone, and 5 both laboratory and clinical means; in the third group, except for one city for which data is lacking, and for Wilmington, which makes no verification, laboratory (33) or clinical (1), or both means (14) are used in every city; in the fourth group cities, one city does not verify (Wilkes-Barre), 13 use laboratory, and 8 both laboratory and clinical means. For all cities combined we find 64 using laboratory means, 1 clinical means alone, 31 both laboratory and clinical, and 3 make no verification (one city not reporting).

Similarly for diphtheria the experience of all the cities combined is that 68 use laboratory verification and 3 clinical means alone, 27 both laboratory and clinical, 1 neither means (one not reporting).

In scarlet fever 90 cities use clinical means alone, 1 both, 5 neither, and 4 have not reported.

In smallpox 97 use clinical means, 1 does not verify, 2 not reporting.

For measles 82 make clinical verification, 10 do not verify, 8 not reporting.

For mumps 66 use clinical means, 28 use no means, 6 not reporting.

For whooping cough 76 use clinical means, 23 neither, and 1 not reporting.

For chicken pox 86 use clinical means, 13 do not verify, no data from one city.

For meningococcus meningitis 43 cities use the laboratory, 17 clinical, 33 both means, and 5 neither for verification, 2 cities not reporting.

For poliomyelitis 6 cities use the laboratory, 72 clinical, 11 both means, and 10 neither for verification, 1 city not reporting.

Only an impression of generally prevalent practice can be obtained from the following table, and analysis of the practice by groups of cities becomes increasingly cumbersome in written description.

TABLE VI.—Procedures adopted for verification of diagnosis in 100 cities

Number of cities in which diagnosis is verified by laboratory examination, clinical observation of patient or both procedures																								
Group I					Group II				Group III					Group IV					All cities					
Laboratory	Clinical	Both	Neither	No data	Laboratory	Clinical	Both	Neither	Laboratory	Clinical	Both	Neither	No data	Laboratory	Clinical	Both	Neither	No data	Laboratory	Clinical	Both	Neither	No data	
Typhoid.....	8	0	4	0	10	0	5	1	33	1	14	1	1	13	0	8	1	0	64	1	31	3	3	1
Diphtheria.....	6	0	5	0	12	0	4	0	36	3	11	0	0	14	0	7	3	0	68	3	27	1	1	0
Scarlet fever.....	0	9	1	1	0	15	0	1	0	46	0	2	2	0	20	0	1	1	0	90	0	0	5	1
Smallpox.....	0	12	0	0	0	16	0	0	0	49	0	0	1	0	20	0	1	1	0	97	0	1	1	0
Measles.....	0	10	0	1	0	13	0	0	0	41	0	6	3	0	18	0	3	1	0	82	0	0	13	2
Mumps.....	0	9	0	1	0	11	0	5	0	33	0	13	4	0	13	0	7	2	0	66	0	0	28	6
Whooping cough.....	0	9	0	0	0	13	0	3	0	38	0	11	1	0	16	0	6	0	0	76	0	0	13	1
Chicken pox.....	0	11	0	0	0	14	0	2	0	43	0	6	1	0	18	0	4	0	0	86	0	0	13	2
Meningitis.....	7	0	5	0	5	1	9	1	21	13	13	2	1	10	3	6	2	1	43	17	33	5	1	0
Polio myelitis.....	1	4	6	1	0	13	1	2	3	41	3	2	2	2	14	1	5	0	6	72	11	10	1	0

4. CURRENT STUDIES OF COMMUNICABLE-DISEASE PREVALENCE

Since there is no better practicable way of describing the character of so-called epidemiological studies of communicable disease than to make record of the extent to which current reports of disease are applied systematically by case cards for personal and family relationships, spot maps of distribution by area and chronological charts of distribution by date of onset or of report of cases, we must continue to describe, as was attempted in the 1920 report, the current practice in this function of health departments. The smaller the area and population, the more readily can the alert and ubiquitous health officer keep himself informed of disease prevalence and distribution, but it is fair to say that in none of the cities under consideration is it safe to rely upon the memory or self-confidence of the health officer unsupported, checked and reminded of the facts as they change from day to day by the records of cases with location and dates of occurrence so expressed graphically or by consecutive columns of figures as to make clear and striking the picture of disease as a community or mass population problem. We shall, therefore, take it for granted that the systematic current preparation and use of case cards sometimes called epidemiological histories, the plotting of cases upon a map of the city as they develop, preferably in a way to distinguish disease and time of report, and the tabulation of cases chronologically, preferably for periods no larger than weeks, are desirable always and may be indispensable even in periods of slight, sporadic, or endemic incidence of the major communicable diseases.

The following table gives the facts by groups of cities and for the diseases most commonly reported.

TABLE VII.—Use of case cards, spot maps, and chronological charts for certain diseases

	Number of cities using cards, maps, or charts, by groups											
	Group I (12 cities)						Group II (16 cities)					
	Cards			Maps			Cards			Maps		
	Yes	No	? ¹	Yes	No	?	Yes	No	?	Yes	No	?
Typhoid.....	12	0	0	7	5	0	13	3	0	8	11	1
Diphtheria.....	9	3	0	7	5	0	11	5	0	9	11	0
Scarlet fever.....	9	3	0	7	6	0	11	5	0	9	10	1
Smallpox.....	11	1	0	6	6	0	11	5	0	9	12	1
Measles.....	7	4	1	3	9	0	11	8	0	7	13	1
Mumps.....	5	6	1	2	10	0	6	8	2	0	11	4
Chicken pox.....	7	4	1	1	10	0	7	8	2	0	13	1
Whooping cough.....	7	4	1	3	9	0	7	8	0	2	13	2
Meningitis.....	8	3	1	4	7	1	8	8	0	3	14	0
Poliomyelitis.....	7	4	1	5	6	1	10	5	1	3	12	3
Influenza.....	5	5	2	2	9	1	6	6	0	2	11	3
Pneumonia.....	4	6	2	2	9	1	5	9	1	1	11	4
Tuberculosis.....	8	2	2	6	4	2	7	7	2	0	11	4

	Number of cities using cards, maps, or charts, by groups											
	Group III (50 cities)						Group IV (22 cities)					
	Cards			Maps			Cards			Maps		
	Yes	No	?	Yes	No	?	Yes	No	?	Yes	No	?
Typhoid.....	40	10	0	27	23	0	16	6	0	11	14	0
Diphtheria.....	32	17	1	26	24	0	14	8	0	13	13	0
Scarlet fever.....	32	17	1	24	26	0	13	9	0	9	13	0
Smallpox.....	29	18	3	17	30	3	14	8	0	14	16	0
Measles.....	19	29	2	11	37	2	10	11	0	17	15	0
Mumps.....	14	30	6	6	38	6	7	12	4	18	16	3
Chicken pox.....	18	29	3	6	40	4	6	13	3	16	16	3
Whooping cough.....	17	30	3	6	40	4	8	11	2	18	18	1
Meningitis.....	33	15	2	10	38	2	12	9	0	22	40	2
Poliomyelitis.....	31	16	3	15	34	1	12	9	1	16	19	0
Influenza.....	12	31	7	7	35	8	5	14	3	20	17	2
Pneumonia.....	8	35	7	3	41	6	4	15	3	20	19	1
Tuberculosis.....	28	16	6	16	30	4	9	11	0	18	17	1

¹ Indicates "no information."

As compared with the practice of 83 cities in 1920, we find an increase in the use of case cards and chronological charts for typhoid fever from 78.3 per cent to 83 per cent and from 27.7 per cent to 33 per cent, respectively, while 54 per cent used spot maps in 1924 as compared with 54.2 per cent in 1920. In diphtheria, in 1920, 69.9 per cent used case cards; in 1924, 70 per cent; in 1920, 50 per cent used spot maps; in 1924, 56 per cent; in 1920, 22.9 per cent used chronological charts, in 1924, 34 per cent. In scarlet fever in 1920, 67.5 per cent used case cards, while in 1924, 66 per cent did so; in 1920, 50.6 per cent used spot maps, in 1924, 64 per cent used them; in 1920, 24.1 per cent kept chronological charts, in 1924, 35 per cent kept them. On the whole this shows a gain in the use of reliable means of studying currently the communicable diseases.

It would be of much interest to know whether in the numerous instances where the three types of record above discussed are not used by municipal health departments, this is the result of a definitely unfavorable opinion of the health officer as to their value in his community, or because of insufficient funds to put this combination of field and office work into operation, or whether he feels that neither he, himself, nor any of his subordinates are able to make practical use of this type of analysis of incidence and distribution of disease.

A description of the practice of each of the cities would unduly expand the text but observations upon the procedure in the cities arranged in the four groups may be helpful.

In the first group of cities all use the case card for communicable diseases, some making an exception of one disease, some of another. Buffalo, Los Angeles, and San Francisco make no exceptions, Chicago omits only mumps. Philadelphia and Pittsburgh omit influenza and pneumonia. Five cities omit from six to nine diseases, and Baltimore uses case cards only in typhoid fever.

Neither in Boston nor in Chicago does the board of health use any of these particular records in tuberculosis as that disease is cared for in both of these cities by a separate municipal department.

The spot map is used by all the cities except Pittsburgh. Buffalo and St. Louis use it only in tuberculosis. Baltimore in typhoid fever and diphtheria, Boston in whooping cough and influenza, six cities in from 3 to 7 diseases, and San Francisco in all 13.

Seven of the cities use the chronological chart, five do not. Cleveland and San Francisco use it in all diseases, Chicago in all except tuberculosis, Boston and St. Louis omit pneumonia, Buffalo omits influenza, pneumonia, and tuberculosis, and Detroit uses it in seven diseases.

Among the second group of cities, all except New Orleans and Washington use case cards, although in Cincinnati and Kansas City,

Mo., this is only for typhoid fever. Among the remainder the practice prevails for the major communicable diseases, and for Columbus, Jersey City, Minneapolis, and Portland cards are kept for all the reportable diseases. Denver and Indianapolis omit only pneumonia, Milwaukee only mumps, and Seattle only influenza and pneumonia.

The spot map is not used in Jersey City, Kansas City, Mo., Minneapolis, Portland, Rochester, and Seattle, but is for the major diseases in the other cities.

The chronological chart is not used in Cincinnati, Columbus, Denver, Jersey City, Portland, Seattle, Toledo, and Washington, and only for typhoid in Kansas City, Mo. The other cities use such a chart for the major communicable diseases.

It is worth noting that no city of the first or second groups fails to use some one of the three procedures discussed, although Pittsburgh, Jersey City, Portland, and Seattle neither prepare spot maps nor keep chronological charts, a distinction recorded for the last three of these cities and for Minneapolis and Kansas City, Mo., as well in 1920.

Among the cities of the third group, 7 make no use of case cards (Providence, Salt Lake City, San Antonio, Trenton, Tulsa, Wilmington, and Youngstown), and Fall River and New Bedford only in tuberculosis, 16 use no spot maps, 32 keep no chronological charts for any disease. If only one disease is recorded by the special case cards, or on spot maps or by chronological charts, it is pretty sure to be typhoid, the other diseases in order of frequency being diphtheria, poliomyelitis, scarlet fever, meningitis, and smallpox. Usually where case cards are kept for the major diseases, spot maps are used as well. In Akron, Cambridge, Des Moines, Flint, Memphis, New Haven, Norfolk, Oakland, Richmond, Syracuse, and Worcester the important communicable diseases are recorded on special case cards, are located on spot maps, and are listed on chronological charts. (In Syracuse only diphtheria and scarlet fever are charted, only typhoid, diphtheria, and scarlet fever are mapped, and these, together with poliomyelitis, are kept on case cards.)

Among the fourth group of cities, nine, Bayonne, Knoxville, Lawrence, Manchester, Peoria, St. Joseph, San Diego, Somerville, and Wilkes-Barre, make no spot maps, and 13, Bayonne, Canton, Evansville, Fort Wayne, Harrisburg, Knoxville, Peoria, St. Joseph, Schenectady, Sioux City, South Bend, Wichita, and Wilkes-Barre, keep no chronological charts. Those cities which make use of all three of these desirable procedures are Allentown, El Paso, Savannah, Troy, and Waterbury for all or at least for the major communicable diseases.

5. CONTROL MEASURES FOR SPECIAL DISEASES

(1) *Typhoid fever*

Placarding.—Fifty-seven of the 100 cities placard the place of residence of typhoid-fever patients. Of the first group, Baltimore, Buffalo, New York, and San Francisco do not placard. Of the second group, Cincinnati, Columbus, Indianapolis, Kansas City, Mo., Newark, Rochester, and Washington do not. Of the third group, 19 do not placard—Cambridge, Camden, Des Moines, Elizabeth, Fall River, Jacksonville, Lowell, New Bedford, Norfolk, Omaha, Paterson, Richmond, St. Paul, Springfield, Syracuse, Trenton, Worcester, Yonkers, Youngstown. Of the fourth group, 11 do not placard—Bayonne, Evansville, Fort Wayne, Knoxville, Lawrence, Manchester, Savannah, San Diego, Sioux City, Somerville, South Bend. Two cities in Group III gave no information on this point.

Isolation.—While information is lacking from 2 cities—Atlanta and Cambridge—the records are definite to the effect that isolation is established in a modified or absolute form in 88 cities. No isolation is required in Baltimore, Columbus, Kansas City, Mo., Rochester, Washington, Des Moines, Jacksonville, Trenton, Fort Wayne, and Knoxville. In Somerville all cases are hospitalized. In first-group cities isolation is absolute in 3 and modified in 8; in the second group it is absolute in 1 and modified in 11; in the third group it is absolute in 13 and modified in 32; in the fourth group it is absolute in 5 and modified in 15.

Control of contacts.—Contacts are not immunized in Los Angeles. In the other 11 cities of the first-group contacts are immunized, i. e., immunization is urged, and where continued contact is unavoidable or probable and the contacts decline immunization the patient may be required to accept hospitalization. Immunization is insisted upon, but is not enforceable against the consent of the individual. Among second-group cities immunization is routine in 7—Denver, Indianapolis, Kansas City, Mo., Louisville, Newark, New Orleans, Rochester. The other 9 do not practice immunization of contacts.

In third-group cities contacts are not immunized in 14 cities—Albany, Atlanta, Camden, Duluth, Erie, Kansas City, Kans., Lynn, Norfolk, Oakland, Omaha, Paterson, Scranton, Spokane, and Wilmington. The information is lacking from Providence. It is routine in the other 35 cities.

In the fourth-group cities contacts are not immunized in 7—Bayonne, Peoria, San Diego, Schenectady, South Bend, Troy, and Wilkes-Barre. In the remaining 15 cities it is the routine practice.

New York and Chicago hospitalize all patients unable to maintain proper precautions in the home. In New York and Boston known carriers are restrained if they are food handlers, and this practice, even though not stated in all instances, is usual practice in first-group cities.

In second-group cities Columbus urges hospitalization upon all patients. Denver keeps carriers under supervision. In Rochester carriers are treated as cases, and stool cultures are made from contacts.

In third-group cities carriers are treated administratively as cases in Cambridge. Contacts are examined and restrained, if food handlers, in Houston, Hartford, and Providence, and in the latter city food-handler cases of typhoid are removed from home for hospital care.

Of the fourth group cities, in Waterbury contacts are examined and treated as cases until free from evidence of the carrier state. In Tulsa milk bottles may not be removed from the premises of an isolated case. In El Paso special examination is made of contacts who are milk or food handlers.

Release from isolation.—The records received from all groups of cities are so incomplete as to forbid any general statement or permit the giving of specific and complete description of the practice in releasing cases, with or without culture, on the basis of an established period of time after onset or cessation of fever. In five of the cities of the first group release from isolation is based on at least one negative stool culture. In Detroit this precaution is reserved for food handlers. In New York two negative urine and stool cultures seven days apart are required for release. Three—Boston, Philadelphia, and St. Louis—release, respectively, after 42, 30, and 21 days isolation. Pittsburgh releases seven days after clinical recovery. Baltimore requires no isolation.

In Group II, seven cities—Cincinnati, Columbus, Denver, New Orleans, Portland, Rochester, and Seattle—require a laboratory report of negative stools. New Orleans also requires a clinical recovery. Clinical recovery only is required for release in Indianapolis, Jersey City, Milwaukee, and Minneapolis. Louisville, Newark, and Toledo require respectively 60, 30, and 42 days from the onset. Kansas City, Mo., and Washington impose no quarantine.

In Group III, 13 cities—Akron, Bridgeport, Dayton, Duluth, Fall River, Flint, Houston, New Haven, Oakland, Reading, Tacoma, Wilmington, and Yonkers—require laboratory negatives for release. Clinical recovery only is required in 21 cities; Birmingham and Providence require, respectively, periods of 10 and 14 days after the temperature has become normal. Spokane limits its period to

36 and Worcester to 42 days. Jacksonville, Lowell, and Trenton establish no quarantine. No information was obtained from the remaining 9 cities.

In Group IV, five cities—Allentown, Canton, Peoria, San Diego, and Waterbury—require negative stools for release. Bayonne, Lawrence, St. Joseph, Sioux City, and South Bend require, respectively, isolation for 75, 28, 21, 42, and 35 days. Fort Wayne establishes no quarantine. The remaining 11 cities release on report of clinical recovery.

(2) *Diphtheria*

Placarding.—We have record of the routine placarding for diphtheria in all the 100 cities. In buildings housing more than one family the practice is general, though not universal, to put the placard only upon the door of entrance to the portion of the building where the family of the infected and isolated individual lives. It is not stated in any of the answers that the placard is placed only on the door of the room actually occupied by the patient, although it is known that this practice is approved and used in some cities.

Isolation.—All the cities report that isolation is required and enforced. Of the first-group cities Pittsburgh reports a modified isolation, the others absolute isolation.

Of the second-group cities, modified isolation is called for in Milwaukee, Newark, and Rochester, and in the remaining 13 cities it is absolute.

Of the third-group cities, modified isolation is required in Birmingham, Cambridge, Camden, Dallas, Fort Worth, Houston, Lynn, New Bedford, New Haven, Oakland, Providence, Reading, Richmond, San Antonio, and Wilmington; in the remaining 35 cities isolation is absolute.

Of the fourth group cities, isolation is of modified type in Bayonne, Knoxville, and Wilkes-Barre, and in the remaining 19 it is absolute.

Control of contacts.—In 65 of the 100 cities contacts of known cases of diphtheria are cultured as a routine practice, although many details as to appropriate discrimination in the procedure, according to age and occupation of the patient and the exposed persons, are lacking.

Culturing of contacts is apparently not done in St. Louis and Los Angeles, and in not more than 50 per cent of the cases in Detroit; in a varying small percentage in Baltimore, Buffalo, and Pittsburgh; in the other seven of the first group it is the routine procedure.

Among the second-group cities it is routine in 11. In four—Toledo, Minneapolis, New Orleans, Washington—it is not done. In Newark some attempt is made.

Of the third-group cities it is routine in 43; it is not done in 7—Atlanta, Fall River, Jacksonville, Kansas City, Kans., Memphis, Paterson, Wilmington—and is attempted in 10—Elizabeth, Hartford, Lowell, New Bedford, Providence, Salt Lake City, Syracuse, Tacoma, Trenton, Yonkers.

Of the fourth-group cities culturing contacts is not done in Wilkes-Barre, but is routine in the other 21.

There is insufficient information to pick out cities where reculturing of contacts is done. Food handlers are noted for special precautions whether as cases, carriers, or contacts, and in the main, especially if milk product handlers, are treated as active cases until released by two or more negative cultures. However, exact report in this particular is too rare to be quoted. Carriers are treated as cases unless found to be harboring nonvirulent bacilli—in Boston, Cleveland, New York, Los Angeles, and St. Louis, of the first group; in Columbus, Jersey City, Kansas City, Mo., Minneapolis, Newark, Portland, Rochester, and Seattle, of the second group; in Duluth, Nashville, Norfolk, Providence, Trenton, and Yonkers, of the third group; and in Allentown, El Paso, Evansville, Fort Wayne, Harrisburg, Manchester, Peoria, St. Joseph, San Diego, Somerville, Tulsa, Waterbury, and Wichita, of the fourth group.

Out of the 100 cities a negative laboratory report was required for release in 92. One city required three negative cultures, the rest two, taken at least 24 hours apart.

Group I.—Patients were released only on culture or on culture following a minimum period of isolation in 10 cities. The minimum periods vary from 8 to 21 days. Philadelphia released after 14 days minimum and clinical recovery. Pittsburgh after from 14 to 21 days and clinical recovery.

Group II.—All cities required release cultures, 8 of them specifying a minimum allowable quarantine varying from 10 to 21 days.

Group III.—Forty-six cities required release cultures, 15 of these specifying a minimum period which varied from 9 to 21 days. Four cities require a minimum period of isolation of from 10 to 21 days with clinical recovery.

Group IV.—Twenty cities require release cultures, 10 of them specifying a minimum isolation of from 7 to 20 days. Bayonne released after 21 days with no other restriction, and Knoxville required 14 days after clinical recovery.

The reply from no city gives any information as to the practice in authorizing removal of persons from the premises occupied by the isolated individual.

The Schick test is used to a steadily increasing degree in many cities: In the first group, Baltimore, Chicago, Detroit, Los Angeles, New York, and St. Louis; in the second group, Cincinnati, Louis-

ville, Milwaukee, Newark, Portland, Rochester, Toledo, and Washington; in the third group, Des Moines, Erie, Fall River, Grand Rapids, Lowell, Lynn, Memphis, New Bedford, New Haven, Norfolk, Providence, Reading, Richmond, Somerville, Syracuse, Utica, and Worcester; in the fourth group, Allentown, Canton, Harrisburg, Lawrence, Manchester, San Diego, Savannah, Schenectady, and Sioux City.

Immunization.—The use of toxin-antitoxin mixture to produce active immunization is reported to the extent of 218,630 persons, of which—

146,942 were in 4 first-group cities.

26,005 were in 5 second-group cities.

28,622 were in 16 third-group cities.

17,061 were in 8 fourth-group cities.

Hospitalization.—This varies widely among the cities of all groups as will be seen from the following summary of reports.

Among the eight first-group cities reporting, the percentage of reported cases which were hospitalized ranged from 10 per cent in Buffalo to 85 per cent in San Francisco. In 13 second-group cities reporting upon hospitalization, the range was from 5 per cent in Indianapolis and Louisville to 50 per cent in Denver. Among third-group cities the percentage of reported cases of diphtheria which were hospitalized in the 40 cities giving information on that point ranged from 1 per cent in Richmond to 80 per cent in Utica. In the fourth group the 10 cities which hospitalized varied in percentage from “a few” in Savannah to 75 per cent in Sioux City.

(3) *Scarlet fever*

Placarding.—All cities answered this question and all the answers were positive. The house or apartment is placarded in all cities except Albany, where the placard is placed on the door of the room occupied by the isolated patient.

Isolation.—Cases of scarlet fever are isolated in all cities in the first group. In second-group cities, in Milwaukee isolation is reported as “absolute whenever possible” and in Louisville it is said to be “advised but can not be enforced.” There was no reply from Troy, of the fourth group. Ninety-eight of the one hundred cities give some definite information as to the character of isolation required.

Control of contacts.—Nothing of any value is to be learned from answers to this question. The replies where they exist show almost total lack of understanding of the intent of the inquiry. It can hardly be credited that the following statements are correct, although

copied directly from the replies, namely, that contacts are immunized in Sioux City and Worcester.

Release from isolation.—Release of cases of scarlet fever is based on a definite time limit in most of the cities, but as many failed to fill out the space provided in the questionnaire full information can not be offered.

The practice in the first-group cities is to release 21 days after onset in Baltimore, Los Angeles, and St. Louis; 28 days after onset in Boston, Chicago, Detroit, and San Francisco; 30 days after onset in Buffalo, Cleveland, New York, Pittsburgh, and Philadelphia.

It is understood that these release periods are not applied arbitrarily, but prevail only when there are no remaining infectious discharges from inflamed surfaces such as throat, ears, or glands.

Among the second-group cities the periods after which release is permitted are 21 days after onset in New Orleans, Seattle, and Washington; 23 days after onset in Minneapolis; 25 days after onset in Indianapolis; 28 days after onset in Denver and Milwaukee; 30 days after onset in Cincinnati, Columbus, Kansas City, Mo., Louisville, Jersey City, Newark, Portland, Rochester, and Toledo.

No time limit is specified for 5 cities of the third group, the periods of isolation required in the remaining 45 cities of the group ranging from 21 days in Atlanta, Elizabeth, Fort Worth, Hartford, Houston, Kansas City, Kans., Memphis, New Haven, and St. Paul to 35 days in Spokane and Springfield.

In the fourth group, of the 21 cities reporting definite periods of required isolation, the range is from 21 days in Evansville, Fort Wayne, Savannah, South Bend, Waterbury, and Wichita, to 35 days in Sioux City, the majority requiring 28 to 30 days. Harrisburg has a discretionary period 30 to 60 days. Knoxville requires a period of 14 days after clinical recovery.

(4) *Smallpox*

Placarding.—Except in 10 of the 44 cities where all cases are hospitalized placarding is required. In Salt Lake City 50 per cent are hospitalized. (No information from Troy.)

Isolation.—Isolation is absolute in all cities of the first group, in 14 cities of the second group, isolation being modified in Milwaukee and Rochester; and in 46 cities of the third group, modified in Birmingham, where none are hospitalized, Dallas, where 100 per cent are hospitalized, and Nashville where 5 per cent are hospitalized. In the fourth group all 22 cities require absolute isolation whether or not the patients are hospitalized.

Control of contacts.—All contacts are immunized in cities of the first group.

In second-group cities all contacts are immunized.

In third-group cities immunization is carried out in all reporting, except in Atlanta, Fort Worth, Paterson, Lynn, and Wilmington, where this is not the practice. Utica gave no data on this point.

All cities of the fourth group, except Troy and Wilkes-Barre, immunize contacts.

Isolation period.—Among the first group of cities specifying a required period of isolation, which is understood to be a minimum, a further period being demanded if the scars have not yet healed, the following is the practice:

	Days		Days
St. Louis	11	Los Angeles	21
Detroit	14	San Francisco	28
Buffalo	14	Philadelphia	30
New York	14	Pittsburgh	30

For second-group cities specifying the period of isolation, we find required:

	Days		Days
Toledo	10	Indianapolis	16
Jersey City	14	Portland	21

For third-group cities the record is:

	Days		Days
Des Moines	14	Duluth	21
Trenton	14	Flint	21
Yonkers	14	Fort Worth	21
Kansas City, Kans.	14	Omaha	21
Spokane	14	Paterson	21
Albany	14	Salt Lake City	21
New Bedford	14	Providence	21
Syracuse	14	Richmond	24
Springfield	15	Camden	28
Fall River	16	Bridgeport	30
Akron	17	Erie	30
Birmingham	21	Norfolk	30
Elizabeth	21	Reading	30

Of the fourth-group cities the isolation period is:

	Days		Days
Schenectady	14	Manchester	21
Troy	14	St. Joseph	21
Wilkes-Barre	14	South Bend	21
Sioux City	17	Wichita	21
Canton	21	Harrisburg	30
El Paso	21	Allentown	30
Fort Wayne	21		

Knoxville, recovery and 16 days.

In Milwaukee routine house-to-house vaccination of contacts is carried out and in addition a widespread vaccination of persons in industrial plants.

In Dayton there is practically no vaccination carried out among pupils of the parochial schools except when smallpox is actually present in this city. This statement would hold for the great majority of the 100 cities.

(5) *Measles*

Placarding.—Placarding for measles is not done in 25 cities. First group, Detroit, Los Angeles, New York, and San Francisco; second group Cincinnati, Louisville, Minneapolis, New Orleans, Rochester, and Washington; third group, 13 cities; fourth group, Manchester and Somerville. (Report not received from Bayonne.)

Isolation.—Isolation for measles is reported to be absolute in Boston, Cleveland, and St. Louis, not required at all in Detroit and Los Angeles, and to be modified in the other 7 cities of the first group.

In the second group it is said to be absolute in Columbus and Kansas City, Mo., not called for in Washington, and modified in the other 13 cities.

In the third group isolation is said to be absolute in 14 cities (Albany, Elizabeth, Fall River, Jacksonville, Lowell, Memphis, Norfolk, Paterson, St. Paul, Scranton, Spokane, Syracuse, Utica, Yonkers), not required in Akron, Birmingham, Camden, Des Moines, and Hartford, not stated for Dallas, and modified in the other 30 cities.

In the fourth group isolation is reported as absolute in Evansville, Lawrence, and Troy, not required in Fort Wayne and San Diego, and modified in the other 17 cities.

Immunization.—The practice of immunization of contacts is said to prevail to some extent in Boston, Buffalo, Cincinnati, Detroit, New York, and Syracuse.

Release from isolation.—For the cities which gave definite replies the required periods of isolation are given as follows:

Number of days required for isolation of measles

GROUP I

	Days		Days
Baltimore.....	5	Boston.....	8
Buffalo	5	St. Louis.....	14
Chicago.....	5	Philadelphia	16
Cleveland.....	5	Pittsburgh.....	16
New York.....	5	San Francisco.....	21
Detroit	7		

Los Angeles requires no isolation.

GROUP II

	Days		Days
Rochester.....	7	Indianapolis.....	14
Cincinnati.....	7	Kansas City, Mo.....	14
Columbus.....	7	Milwaukee.....	14
Portland.....	7	Newark.....	14
Minneapolis.....	8	Seattle.....	14
Toledo.....	10	Jersey City.....	21
Denver.....	14	Louisville.....	21

New Orleans releases on clinical recovery.

Washington requires no isolation.

GROUP III

	Days		Days
Syracuse.....	5	Albany.....	14
Yonkers.....	5	Atlanta.....	14
Dayton.....	7	Camden.....	14
Grand Rapids.....	7	Des Moines.....	14
Kansas City, Kans.....	7	Duluth.....	14
Oakland.....	7	Nashville.....	14
Bridgeport.....	7	Norfolk.....	14
Memphis.....	7	Oklahoma City.....	14
Providence.....	7	St. Paul.....	14
Trenton.....	7	Salt Lake City.....	14
Wilmington.....	7	Spokane.....	14
Elizabeth.....	10	Springfield.....	14
Fall River.....	10	Tulsa.....	14
Flint.....	10	Youngstown.....	14
Lowell.....	10	Tacoma.....	15
Lynn.....	10	Erie.....	16
New Haven.....	10	Reading.....	16
Paterson.....	10	Scranton.....	16
Worcester.....	10	Cambridge.....	21
Omaha.....	10	Fort Worth.....	21
Utica.....	11	Houston.....	21
Richmond.....	12		

Clinical recovery: Jacksonville, New Bedford, San Antonio.

No isolation required: Akron, Birmingham, Hartford.

No report from Dallas.

GROUP IV

	Days		Days
Schenectady.....	5	Lawrence.....	14
Troy.....	5	St. Joseph.....	14
Wilkes-Barre.....	5	San Diego.....	14
Waterbury.....	7	Sioux City.....	14
Canton.....	10	South Bend.....	14
Manchester.....	10	Wichita.....	14
Savannah.....	10	Harrisburg.....	16
El Paso.....	14	Allentown.....	16
Fort Wayne.....	14	Bayonne.....	21

Clinical recovery: Evansville, Peoria, Somerville.

Knoxville requires 14 days after clinical recovery.

(6) *Mumps*

Placarding.—Cases of mumps are said to be placarded in 40 cities. No information was received from 2 and placarding is not done in 58 cities. The practice in the several groups of cities is as follows:

First group.—Cases are placarded in Baltimore, Cleveland, Philadelphia, and Pittsburgh; not in Boston, Buffalo, Chicago, Detroit, Los Angeles, New York, St. Louis, and San Francisco.

Second group.—Cases are placarded in Denver, Indianapolis, Jersey City, Kansas City, Mo., Milwaukee, Portland, and Seattle; not in Cincinnati, Columbus, Louisville, Minneapolis, Newark, New Orleans, Rochester, Toledo, and Washington.

Third group.—Cases are placarded (16 cities) in Dallas, Des Moines, Duluth, Erie, Flint, Grand Rapids, Houston, Kansas City, Kans., Omaha, Reading, Salt Lake City, Scranton, Tacoma, Tulsa, Wilmington, and Worcester; not in (32 cities), Akron, Birmingham, Bridgeport, Cambridge, Camden, Dayton, Elizabeth, Fall River, Fort Worth, Hartford, Jacksonville, Lowell, Lynn, Memphis, Nashville, New Bedford, New Haven, Norfolk, Oakland, Oklahoma City, Paterson, Providence, Richmond, St. Paul, San Antonio, Spokane, Springfield, Syracuse, Trenton, Utica, Yonkers, and Youngstown. No report from Albany and Atlanta.

Fourth group.—Cases are placarded in Allentown, Canton, El Paso, Harrisburg, Knoxville, Peoria, St. Joseph, San Diego, Schenectady, Sioux City, Waterbury, Wichita, and Wilkes-Barre; not in Bayonne, Evansville, Fort Wayne, Lawrence, Manchester, Savannah, Somerville, South Bend, and Troy.

In Portland, Denver, and Omaha the placards are placed on the door of the room occupied by the isolated patient; in other placarding cities on the door of the residence, house, or apartment.

Isolation.—Cases of mumps are subjected to absolute isolation in Cleveland, first group; Kansas City, Mo., second group; Jacksonville, St. Paul, Scranton, and Utica, third group. They are not isolated in Los Angeles, first group; Columbus, New Orleans, Toledo, and Washington, second group; Akron, Birmingham, Camden, Des Moines, Fall River, Hartford, Lowell, New Haven, Providence, Richmond, San Antonio, Spokane, Syracuse, of the third group; Evansville, Fort Wayne, San Diego, Savannah, South Bend, and Troy of the fourth group.

No report on this point was received from Albany or Atlanta. In all other cities not mentioned isolation is of the modified type, 10 in Group I, 11 in Group II, 31 in Group III, 16 in Group IV.

Control of contacts.—There is no information from any city as to the practice of supervision of contacts. Rarely is any attempt made to control contacts.

Release from isolation.—Release of cases from isolation is upon notice of recovery or not prior to a specified number of days since onset, this arbitrary period varying widely and apparently having little relation in a majority of cities reporting to the probabilities of the period of communicability.

The practice of the cities in this regard is shown in the following summary:

Number of days required for isolation of mumps

GROUP I

	Days		Days
Baltimore_____	7	San Francisco_____	14
Chicago_____	10	Pittsburgh _____	16
Buffalo _____	14	Boston_____	21
St. Louis_____	14	Philadelphia _____	21
New York_____	14		

Cleveland releases on clinical recovery.

Detroit releases one week after clinical recovery.

Los Angeles requires no isolation.

GROUP II

	Days		Days
Indianapolis _____	10	Portland_____	14
Minneapolis_____	10	Seattle_____	14
Denver _____	14	Jersey City_____	21
Kansas City, Mo_____	14	Louisville_____	21
Milwaukee_____	14	Rochester_____	21
Newark_____	14		

Cincinnati and Columbus release on clinical recovery.

New Orleans, Toledo, and Washington require no isolation.

GROUP III

	Days		Days
Flint _____	10	Omaha _____	14
Tacoma_____	10	Trenton_____	14
Cambridge _____	14	Yonkers _____	14
Camden _____	14	Erie_____	16
Des Moines_____	14	Reading _____	16
Duluth _____	14	Norfolk_____	21
Jacksonville_____	14	Scranton_____	21
Kansas City, Kans_____	14	Springfield_____	21
Oklahoma City_____	14	Utica_____	21
Salt Lake City_____	14	Worcester _____	21
Bridgeport_____	14	Lowell_____	21
Elizabeth _____	14	Providence_____	21
Oakland _____	14		

Clinical recovery: Dayton, Grand Rapids, Houston, Memphis, Nashville, New Bedford, St. Paul, San Antonio, Tulsa, Wilmington, Youngstown.

Akron, Richmond, Spokane, and Syracuse do not quarantine.

All others not stated.

GROUP IV

	Days		Days
Canton	10	Sioux City.....	14
Lawrence	10	Wichita.....	14
St. Joseph.....	14	Waterbury.....	14
Schenectady	14	Harrisburg.....	16
El Paso.....	14	Allentown.....	21
Manchester	14	Bayonne.....	21
San Diego.....	14		

Clinical recovery: Knoxville, Peoria, Somerville.

No quarantine: Fort Wayne, Evansville, Savannah, South Bend, Troy, Wilkes-Barre.

(7) *Chicken pox*

Placarding.—Placarding is carried out for chicken pox in 60 cities. It is not done in 38 cities and no record was received for the other 2 cities. Placarding is done in 6 cities of Group I, but not in Buffalo, Detroit, Los Angeles, New York, St. Louis and San Francisco; in 10 of the Group II cities, and not in 6; in 28 of Group III and not in 20; in 16 of Group IV and not in 6.

Isolation.—In 78 of the cities isolation is required, in 7 instances an absolute isolation, in 60 cities in modified form, and in 1 unqualified.

Of the first group Boston, Cleveland, and St. Louis call for absolute isolation; Baltimore, Buffalo, Chicago, Philadelphia, Pittsburgh, New York, and San Francisco call for modified; Detroit and Los Angeles none.

Of the second group, Kansas City, Mo., requires absolute isolation; the remainder of this group expect only modified isolation, except New Orleans and Washington, who do not require isolation.

Of the third group, Jacksonville, Memphis, Norfolk, Paterson, St. Paul, Scranton, Spokane, and Utica require absolute, 29 modified, 11 no isolation; for 2 cities there is no report. Of Group IV, 1 city, Evansville, reports unqualified, and 16 modified isolation, while 5 cities do not call for isolation.

Control of contacts.—There is no information on this point reported from any city.

Release from isolation.—Cases isolated for chicken pox are released in cities of Group I on recovery in Cleveland and Detroit, and after a specified number of days as follows in the other cities reporting where isolation is practiced: 7 days, Baltimore; 10 days, Chicago and Boston; 12 days, Buffalo and New York; 14 days, St. Louis and San Francisco; 16 days, Philadelphia and Pittsburgh.

In the second group the practice, where reported, is as follows: Clinical recovery in Cincinnati, Columbus, Milwaukee, New Orleans, Rochester, Seattle; 10 days, Toledo; 12 days, Indianapolis; 14 days,

Minneapolis, Newark, Kansas City, Mo., Portland, and Denver; 21 days, Jersey City and Louisville.

In the third group, of the cities reporting upon release practice, the days specified are: 10 days, Flint, Omaha, and Nashville; 12 days, Camden, Oakland, Paterson, Trenton, and Yonkers; 14 days, Duluth, Elizabeth, Kansas City, Kans., Salt Lake City, Spokane, Tacoma, Worcester, and Youngstown; 15 days, Springfield; 16 days, Erie, Norfolk, Reading and Scranton; 21 days, Cambridge, Fort Worth, and Lowell; 28 days, Des Moines. Seven establish no quarantine, 14 release on clinical recovery, and there are no reports from 4 cities.

In the fourth group, of the 11 specifying their procedure, the days before release are: 10 days, Lawrence; 12 days, Wichita and Schenectady; 14 days, El Paso, Fort Wayne, Manchester, St. Joseph, San Diego, South Bend, and Sioux City; 16 days, Allentown and Harrisburg; 30 days, Bayonne. Three cities, Savannah, Troy, and Wilkes-Barre, establish no quarantine. Six cities release on clinical recovery.

(8) *Whooping cough*

Placarding.—In 63 cities placarding is carried out in cases of whooping cough. It is specified as not being done in 35 cities, and no information was obtained from 2 of the cities.

The cities of the first group requiring placarding are Baltimore, Boston, Chicago, Cleveland, Philadelphia, Pittsburgh, and St. Louis; in Buffalo, Detroit, New York, Los Angeles, and San Francisco it is not required.

Of the second group, those requiring placarding are Cincinnati, Columbus, Denver, Indianapolis, Jersey City, Kansas City, Mo., Milwaukee, Portland, Seattle, and Toledo. It is not required in Louisville, Minneapolis, Newark, New Orleans, Rochester, or Washington.

Twenty-nine cities of the third group and 17 of the fourth group require placarding, while in 19 of the third and 5 of the fourth none is required.

Isolation.—Cases of whooping cough are subjected to absolute isolation in Cleveland of the first group; Kansas City, Mo., second group; Jacksonville, Paterson, St. Paul, Scranton, and Spokane, third group; Lawrence and Evansville, fourth group; subject to none in Los Angeles, first group; Newark and Washington, second group; Birmingham, Camden, Des Moines, Fall River, Hartford, Providence, Richmond, Syracuse, Lowell, and Utica, third group; and Savannah, San Diego, Fort Wayne, and Troy, fourth group. Except for Albany, from which no information was obtained, all the other cities required modified isolation.

In Newark patients, prior to the specified time of release (42 days), must wear an arm band to identify them as whooping-cough patients if they go upon the street or leave their living premises.

Control of contacts.—Immunization is said to be provided for contacts in Baltimore, Buffalo, and St. Louis, first group; Cincinnati and Denver, second group; Cambridge, Dallas, Dayton, and St. Paul, third group. No other information as to isolation or school exclusion or other consideration of contacts is available in the records.

Release from isolation.—Where whooping cough is isolated the period of isolation is specified. In 10 cities of the first group the periods are as follows: Fourteen days in Cleveland, St. Louis, and San Francisco; 21 days in Boston, 28 in Baltimore, 30 in Philadelphia, 35 in Chicago and Pittsburgh, 56 in Buffalo. In Detroit and New York the period is for one week after the last whoop, with an alternative of 56 days in New York. In Los Angeles whooping cough is not isolated. In the second group cities, clinical symptoms are the guide in New Orleans, Rochester, and Seattle; Washington does not isolate. The periods in the other cities are: Fourteen days in Columbus; 28 in Indianapolis, Kansas City, Mo., and Denver; 30 in Cincinnati; 40 in Toledo; 42 in Newark, Minneapolis, Jersey City, and Portland; 60 in Louisville. Milwaukee required 7 days after clinical recovery.

Of the third group, 4 cities did not report. For the 34 cities the days specified are: Fourteen days in Dayton and Des Moines; 21 in Camden, Houston, Lowell, Norfolk, Oakland, Omaha, Providence, Trenton, and St. Paul; 28 in Flint, Grand Rapids, Paterson, Scranton, and Wilmington; 30 in Fort Worth and Reading; 35 in Atlanta, Duluth, Kansas City, Kans., Memphis, Salt Lake City, Springfield, and Worcester; 36 in Spokane; 42 in Akron, Bridgeport, Jacksonville, Nashville, and Tacoma; 56 in Cambridge, Lynn, and Yonkers. Seven cities released on clinical recovery. Five cities required no quarantine.

Of the fourth group, 14 cities report as follows: Fourteen days in St. Joseph, Sioux City, and Waterbury; 21 in El Paso; 28 in Allentown; 30 in Harrisburg; 35 in Fort Wayne, Manchester, and South Bend; 42 in San Diego and Wichita; 56 in Lawrence and Schenectady; 90 in Bayonne. Five cities release on clinical recovery. Three cities require no isolation.

(9) *Meningococcus meningitis*

Placarding.—Placarding is required in all first-group cities except New York and San Francisco; in all the cities of the second group except Washington; in all the third-group cities except in Cam-

bridge, New Bedford, Oakland, and Paterson, where isolation is not required, and in Albany, from which we have no information; and in all the fourth-group cities except Harrisburg, Lawrence, and Somerville where isolation is not required.

Isolation.—Absolute isolation is required in Boston, Buffalo, Chicago, Cleveland, Detroit, Los Angeles, New York, St. Louis, and San Francisco, of the first group; in Cincinnati, Columbus, Indianapolis, Kansas City, Mo., Louisville, Minneapolis, New Orleans, Portland, Rochester, Seattle, and Toledo, of the second group; in 27 cities of the third; and in 12 of the fourth group. Modified isolation is called for in Baltimore, Philadelphia, and Pittsburgh of the first group; in Denver, Jersey City, Milwaukee, and Newark of the second group; and in 19 cities of the third and 9 of the fourth group. No isolation is required in Washington, in 2 of the third and 1 of the fourth-group cities.

Control of contacts

Group I.—New York and St. Louis reported routine culture of contacts.

Group II.—Indianapolis reported immunization of contacts.

Group III.—Bridgeport, Hartford, New Bedford, and Springfield reported efforts at immunization.

Group IV.—Evansville and Sioux City reported immunization.

Release from isolation

Group I.—Recovery and 4 days, Detroit; recovery and 10 days, Cleveland; 10 days in St. Louis; 14 in Buffalo; 21 in Baltimore and Boston; 28 in San Francisco; 30 in Los Angeles.

Buffalo released either after 14 days, or earlier, on negative laboratory findings.

New York released either 14 days after clinical recovery, or on negative laboratory findings.

Chicago, Philadelphia, and Pittsburgh released on clinical recovery.

Group II.—Fourteen days in Milwaukee, Minneapolis, Newark, and Portland; 21 in Cincinnati, Columbus, and Indianapolis. Rochester, Seattle, and Toledo required negative laboratory findings.

Cincinnati, Columbus, Milwaukee, Minneapolis, and New Orleans allowed, as an alternative, release on negative laboratory findings.

Washington established no quarantine.

Five cities released on clinical recovery.

Group III.—Recovery and 7 days in Wilmington; 14 days in Kansas City, Kans., Oakland, Utica, and Yonkers; 15 in Springfield; 21 in Fall River, Omaha, and Richmond; 28 in Lowell; 30 in Jacksonville and Norfolk; 42 in St. Paul.

Negative laboratory findings required in Dayton, Duluth, Houston, Oklahoma City, and Tacoma. Atlanta and Des Moines required clinical recovery and negative laboratory reports. Syracuse and Yonkers accepted either clinical recovery or negative laboratory findings. Providence established no quarantine. Twenty-one cities released on clinical recovery. Nine cities made no report.

Group IV.—Fourteen days in El Paso, Lawrence, Manchester, Schenectady, Troy, and Wilkes-Barre; 21 days in Sioux City, South Bend, and Wichita; 28 in Fort Wayne. Bayonne required negative laboratory findings. Schenectady, Troy, Waterbury, and Wilkes-Barre accepted negative laboratory findings as an alternative. Eleven cities released on clinical recovery.

Some of the cities not reporting and some of those reporting release after a specified period control this practice by microscopic examination of retro-nasal secretions for presence of the meningococcus. The extent to which this is a routine practice can not be learned from the reports.

(10) *Poliomyelitis*

Placarding.—Placarding is practiced in all first and second group cities except Louisville, Rochester, and Washington; in all, except Scranton, where placarding is not required, in the third group; and in all, except Harrisburg, Lawrence, Savannah, and Somerville, which do not require placarding, in the fourth group.

Isolation.—Absolute isolation is required in cities of the first group, except in Baltimore and Philadelphia, where the type is modified; in the second group, absolute in Cincinnati, Columbus, Indianapolis, Jersey City, Kansas City, Mo., New Orleans, Seattle, and Toledo; modified in 7 others, and not established in Washington; in the third group, absolute in 30, modified in 18, and not required in Lowell and Scranton; in the fourth group, absolute in 12, modified in 8, and not required in San Diego and Savannah.

Control of contacts.—It is stated that in Cincinnati efforts are made to immunize contacts.

Release from isolation.—In the cities of Group I, the days required before the isolated patient is released are: 14 days in Buffalo; 21 in Baltimore, Boston, Chicago, Cleveland, New York, Detroit, and Pittsburgh; 30 in Los Angeles, St. Louis, and San Francisco. In the second group, 14 days in Jersey City, Minneapolis, and Portland; 21 in Cincinnati, Columbus, Indianapolis, Louisville, Milwaukee, Newark, and Rochester; 30 in Toledo. In the third group, 14 days in Kansas City, Kans., Paterson, and Tacoma; 21 in Camden, Dayton, Des Moines, Erie, Fall River, Flint, Jacksonville, Memphis, New Bedford, New Haven, Omaha, Providence, Scranton, Syracuse,

Trenton, Utica, Wilmington and Yonkers; 28 in Grand Rapids, Hartford, Lowell, Springfield and Worcester; 30 in Oakland and Reading; 35 in Cambridge and Norfolk; 42 in St. Paul (on physician's opinion); no limit in Lynn. In the fourth group, 2 cities do not isolate (Savannah and San Diego), 14 days in St. Joseph; 21 in Allentown, Harrisburg, Manchester, Schenectady, Troy, Waterbury, Wichita, and Wilkes-Barre; 30 in Sioux City; 35 in South Bend; 56 in El Paso; 60 in Bayonne. Twenty-five cities release on clinical recovery, three establish no quarantine.

(11) *Influenza and pneumonia*

The reporting of influenza and of pneumonia have been of relatively recent origin and in none of the cities has it been taken seriously enough to give confidence in the thoroughness or usefulness of the records. This is made clear by the observation that although 82 cities take credit for requiring the reporting of patients with influenza, as a matter of fact only four cities, Allentown, Baltimore, Schenectady, and St. Joseph, were able to produce a record of the number of cases reported.

Similarly with pneumonia, 79 of the cities claim that this disease is reported, yet the health officers in only six cities could produce records showing how many pneumonia patients were reported in the year—Boston, Camden, Trenton, New Bedford, Paterson and Syracuse.

While the following summary of the statements obtained from health departments in regard to placarding, isolation, both character and duration, hospitalization and disinfection, make a bold showing of accomplishment, they rarely express more than a pious intention or vote of the board of health and can hardly be accepted as indicating any degree of useful epidemiological or sanitary practice likely to result in practical reduction of either disease.

In four cities, Cambridge, Milwaukee, Trenton and Worcester, it is claimed that both influenza and pneumonia are reported, but there is no reason to believe that this implies an administrative practice which includes use of the facts of the report in a way to reduce morbidity or mortality of either disease.

(12) *Influenza*

Reporting.—Reported as routine in 82 cities. Reported only during epidemics in 2 cities. Not reported in 11 cities and no record in 5 cities.

The reported cases are visited by a physician for verification of diagnosis in 11 cities, by a nurse in 9 cities, by an inspector in 12, and by combinations of the three in 9 cities.

Records.—Case cards are used in 28 cities, chronological charts in 17 cities, spot maps in 10 cities, and none of these methods in 62 cities.

Influenza

City	Case cards	Spot maps	Chronological charts
GROUP I			
Boston.....	*	*	*
Buffalo.....	*		
Chicago.....	*		*
Cleveland.....			*
Los Angeles.....	*		
St. Louis.....			*
San Francisco.....	*	*	*
GROUP II			
Denver.....	*		
Indianapolis.....	*	*	*
Jersey City.....	*		
Milwaukee.....	*		
Minneapolis.....	*		
Portland.....	*		
GROUP III			
Bridgeport.....	*	*	
Cambridge.....	*		*
Des Moines.....	*		
Flint.....	*	*	*
Grand Rapids.....	*	*	
Jacksonville.....	*		
Kansas City, Kans.....	*	*	*
Nashville.....	*		
New Haven.....			*
Norfolk.....	*		*
Omaha.....	*		
Providence.....		*	*
Spokane.....			*
Springfield.....	*	*	
Worcester.....	*	*	*
GROUP IV			
Allentown.....	*		
Canton.....	*		
Savannah.....	*		*
Somerville.....	*		*
Waterbury.....	*		*

Placarding.—In 26 cities placarding is carried out in cases of influenza as follows: Group I, St. Louis placards; 8 do not; no information regarding Baltimore, Buffalo, and Detroit. Group II, placarding is done in Denver, Jersey City, Kansas City, Mo., Milwaukee, and Portland; no information from Toledo; the rest (10 cities) do not placard. Group III, placarding is done by Bridgeport, Dallas, Duluth, Flint, Grand Rapids, Kansas City, Kans., Omaha, St. Paul, Salt Lake City, Spokane, Springfield, Worcester, and Youngstown; 24 do not placard; no information from 13 cities. Group IV, placarding is done in Allentown, Peoria, St. Joseph, Sioux City, Waterbury, Wichita, and Wilkes-Barre; 8 do not placard; no information from 7 cities.

Placarding is done by 26 cities, no placarding by 50 cities, no record from 24 cities.

Isolation

Group	Absolute	Modified	None	No record
I	1	7	4	0
II	0	5	7	4
III	5	17	15	13
IV	1	9	6	6
	<hr/> 7	<hr/> 38	<hr/> 32	<hr/> 23

Absolute isolation was required in 7 cities as follows: Group I, Boston; Group III, Omaha, St. Paul, Springfield, Spokane, and Utica; Group IV, Sioux City.

Modified isolation was required in 38 cities as follows: Group I, Baltimore, Buffalo, Chicago, Detroit, New York, St. Louis, and San Francisco; Group II, Denver, Jersey City, Kansas City, Mo., Portland, and Minneapolis; Group III, Bridgeport, Cambridge, Dallas, Duluth, Elizabeth, Flint, Grand Rapids, Houston, Kansas City, Kans., Lynn, New Bedford, Norfolk, Oakland, Salt Lake City, Worcester, Yonkers, and Youngstown; Group IV, Allentown, Bayonne, Lawrence, Peoria, St. Joseph, Somerville, Waterbury, Wichita, and Wilkes-Barre.

No isolation was required in 32 cities as follows: Group I, Cleveland, Los Angeles, Philadelphia, and Pittsburgh; Group II, Cincinnati, Indianapolis, Louisville, Newark, Rochester, Seattle, and Washington; Group III, Dayton, Des Moines, Erie, Fall River, Fort Worth, Hartford, Memphis, Nashville, New Haven, Oklahoma City, Paterson, Providence, San Antonio, Tulsa, and Utica; Group IV, Canton, Harrisburg, Manchester, San Diego, Savannah, and South Bend.

Period of isolation.—Although 45 cities reported isolation of cases of influenza, only 23 made statements covering the period of maintenance. It is to be assumed that in the other 22 instances isolation was terminated on receipt of some report of clinical recovery and might be classed with the 8 who definitely reported that procedure.

From 23 cities the isolation period is reported as follows:

Clinical recovery: Chicago, Bridgeport, Grand Rapids, Utica, Worcester, Youngstown, Allentown, Somerville.

Clinical recovery and 4 days: Omaha. Clinical recovery and 7 days: Kansas City, Kans.; 5 days, Des Moines; 6 days, Detroit, Minneapolis; 7 days, Lawrence; 10 days, Flint, Springfield, Wichita; 14 days, Boston, Kansas City, Mo., Duluth, Sioux City; 25 days, Fort Worth.

Hospitalization.—Reports from 22 cities were received. What proportion of them are applied to epidemic conditions and what to ordinary routine is not known. The reports are as follows:

Group I.—Boston, 50 per cent; Buffalo, 1 per cent; Cleveland, 5.6 per cent; Detroit, 5 per cent; St. Louis, 2 per cent; and San Francisco, 5 per cent.

Group II.—Denver, 10 per cent; Indianapolis, 25 per cent; Jersey City, 50 per cent; Kansas City, Mo., 10 per cent; Portland, 10 per cent; and Rochester, 10 per cent.

Group III.—Dallas, 5 per cent; Flint 3.03 per cent; Kansas City, Kans., 10 per cent; St. Paul, 25 per cent; Salt Lake City, 3 per cent.

Group IV.—Allentown, 5 per cent; St. Joseph, 10 per cent; Sioux City, 25 per cent; South Bend, 20 per cent; Wichita, 10 per cent.

Disinfection.—Concurrent disinfection was reported from 37 cities; terminal cleansing from 22; gaseous disinfection from 6; and no disinfection from 56.

(13) *Pneumonia*

Reporting.—Reported as routine in 79 cities. Not reported in 17 cities and no record from 4 cities.

For verification of diagnosis, the reported cases were visited by a physician in 4 cities, by a nurse in 10 cities, by an inspector in 6 cities, and by a combination of the above in 4 cities.

Records.—Case cards were used in 21 cities, spot maps in 5 cities, chronological charts in 13 cities, and none of these methods in 67 cities.

Pneumonia

City	Case cards	Spot maps	Chrono- logical charts
GROUP I			
Buffalo.....	*		
Chicago.....	*	*	*
Cleveland.....			*
Los Angeles.....	*		
St. Louis.....			*
San Francisco.....	*	*	*
GROUP II			
Jersey City.....	*		
Milwaukee.....	*		
Minneapolis.....	*		
Newark.....			*
Portland.....	*		
Rochester.....	*		
GROUP III			
Bridgeport.....	*		
Cambridge.....	*		*
Flint.....	*	*	*
Grand Rapids.....	*	*	
Jacksonville.....	*		
Kansas City, Kans.....	*		
New Haven.....			*
Norfolk.....	*		*
Providence.....		*	*
Reading.....	*		
Spokane.....			*
GROUP IV			
Allentown.....	*		
Savannah.....	*		
Somerville.....	*		*
Waterbury.....	*		*

Placarding.—Placarding of cases of pneumonia was done in 12 cities. In Group I, Chicago; Group II, Jersey City and Kansas City, Mo.; Group III, Bridgeport, Dallas, Duluth, Flint, and Grand Rapids; Group IV, Allentown, Peoria, St. Joseph, and Waterbury. Fifty-nine cities reported that they did not placard pneumonia. No report was received from 29 cities.

Isolation

Group	Absolute	Modified	None	No record
I.....	0	4	5	3
II.....	0	3	7	6
III.....	0	16	22	12
IV.....	0	8	6	8
	0	31	40	29

No city required an absolute quarantine in pneumonia. Modified quarantine was required by 31 cities as follows: Group I, Baltimore, Chicago, New York, and San Francisco; Group II, Jersey City, Kansas City, Mo., and Minneapolis; Group III, Bridgeport, Cambridge, Dallas, Duluth, Elizabeth, Flint, Grand Rapids, Houston, Lynn, Norfolk, Oakland, St. Paul, Springfield, Utica, Worcester, and Yonkers; Group IV, Allentown, Bayonne, Peoria, St. Joseph, Somerville, Waterbury, Wichita, and Wilkes-Barre.

No quarantine was imposed in pneumonia by 40 cities: Group I, Boston, Cleveland, Los Angeles, Philadelphia, and Pittsburgh; Group II, Cincinnati, Louisville, Newark, Portland, Rochester, Seattle, and Washington; Group III, Dayton, Des Moines, Erie, Fall River, Fort Worth, Hartford, Kansas City, Kans., Lowell, Memphis, Nashville, New Bedford, New Haven, Oklahoma City, Omaha, Paterson, Providence, Salt Lake City, San Antonio, Spokane, Tulsa, Wilmington, and Youngstown; Group IV, Harrisburg, Lawrence, Manchester, San Diego, Savannah, and South Bend. No reports were received from the other 29 cities.

Release from isolation.—One city, Flint, reported a 28-day period, qualified by a question mark. Ten cities reported "clinical findings," "recovery," "physician's report," or "indefinite." The other 89 cities either stated that there was no regulation or failed to answer. It is to be assumed that a report of clinical recovery releases from isolation. No mention of a requirement of laboratory tests was made.

Hospitalization.—Thirty-six cities reported on the percentage of reported cases cared for in hospitals as follows: Group I, Boston, 30;

Buffalo, 8; Cleveland, 18.7; Detroit, 15; St. Louis, 10; and San Francisco, 90. Group II, Denver, 20; Indianapolis, 15; Jersey City, 75; Kansas City, Mo., 5; Louisville, 25; New Orleans, 50; Portland, 75; and Rochester, 10. Group III, Dallas, 15; Dayton, 30; Duluth, 60; Flint, 11; Fort Worth, 25; Houston, 50; Kansas City, Kans., 10; New Bedford, 50; Omaha, 10; St. Paul, 50; Salt Lake City, 2; Trenton, 12; Utica, 7; and Youngstown, 20. Group IV, Allentown, 35; Bayonne, 25; St. Joseph, 10; Schenectady, 60; Sioux City, 25; South Bend, 20; Waterbury, 10; and Wichita, 30.

Disinfection.—Concurrent disinfection was reported from 38 cities, terminal cleansing from 24 cities, gaseous disinfection from 4 cities.

(14) *Tuberculosis*

In tuberculosis the problems of an epidemiological, social, economic, sanitary, and hospital character are so different from those of the acute communicable diseases that the reader is referred to Chapter VI for an adequate consideration of the tuberculosis services in the cities.

(15) *Malaria*

Enough information has been obtained upon the subject of malaria detection, incidence, and control measures to warrant a brief statement on the following points:

Diagnostic facilities provided.—Of the first group cities, Baltimore, Chicago, Cleveland, New York, and St. Louis provide laboratory diagnostic service by microscopic examination of blood smears.

This service is offered also by Cincinnati, Columbus, Denver, Jersey City, Louisville, Newark, New Orleans, Portland, Toledo, and Washington of the second group; by Akron, Atlanta, Birmingham, Bridgeport, Camden, Dallas, Des Moines, Erie, Fall River, Flint, Fort Worth, Hartford, Houston, Jacksonville, Kansas City, Kans., Manchester, Memphis, Nashville, New Haven, Norfolk, Oakland, Oklahoma City, Providence, Paterson, Reading, Richmond, Salt Lake City, San Antonio, Springfield, Syracuse, Wilmington, Worcester, Waterbury, and Youngstown of the third group; and by Bayonne, Canton, El Paso, Evansville, Knoxville, Savannah, Somerville, and Sioux City of the fourth group. Thus 57 of the 100 cities offer this convenience to physicians.

However, when we note the answers from these cities to the question, "Are these diagnostic facilities made use of?" we find a rather different picture. In the first group, Baltimore reports no use made; of the second group, we learn they are not needed in Columbus, Denver, Portland, and Toledo; among the third group, Dayton,

Houston, and Manchester report no need of such facilities, and of the cities having facilities they are not used in Camden, Des Moines, Erie, Fall River, Hartford, Norfolk, Salt Lake City, Springfield, Wilmington, Worcester, and Youngstown; while all of the cities of the fourth group which have facilities report that they are used.

Control measures.—Control measures are in effect in Baltimore, Cambridge, Nashville, New York, and Memphis. In Memphis there is the nearest approach to complete epidemiological study and sanitary and personal control reported by any city.

Incidence.—During 1923 malaria was reported in 5 cities of the first group, with a total of 133 cases, as follows: Baltimore, 33; Boston, 11; Chicago, 17; Cleveland, 9; New York, 52; Philadelphia, 11.

In 4 cities of the second group with 120 cases as follows: Jersey City, 1; Louisville, 2; Newark, 11; New Orleans, 106:

In 16 cities of the third group with 790 cases as follows: Akron, 3; Birmingham, 213; Bridgeport, 1; Cambridge, 2; Dallas, 14; Erie, 1; Flint, 2; Hartford, 6; Jacksonville, 87; Lowell, 1; Memphis, 438; New Haven, 6; Oklahoma City, 2; Paterson, 8; Wilmington, 1; and in 4 cities of Group IV with 58 cases: Evansville, 2; Knoxville, 1; Savannah, 54; Sioux City, 1, or a total of 1,101 cases, of which 898 were reported from the 5 cities of Birmingham, Jacksonville, Memphis, New Orleans, and Savannah.

CONCURRENT DISINFECTION

Reference to Table X will make clear the requirements of concurrent disinfection in typhoid fever, diphtheria, and scarlet fever.

It would appear that many cities do not advise concurrent disinfection in either the major or minor communicable diseases, whereas instruction in the need and in the simple household technique of this procedure is well nigh universal wherever visiting nurses in public or private employ are permitted to give bedside care. Without concurrent disinfection little of real value to the members of the household follows from the procedures of isolation and quarantine. This is the one essential and elementary precaution in every sick room where there is a case of communicable disease. In the interest of the patient, the attendant, the other persons in the family or household, concurrent disinfection is of infinitely more value than terminal disinfection or the mere separation of the sick person in a room apart. Concurrent disinfection of discharges throughout the period of communicability of the disease is the chief object of isolation. Where it is neither taught nor practiced, isolation is profitless.

TABLE X.—*Number of cities in four groups in which concurrent disinfection is required or advised, or is neither required nor advised, in typhoid fever, diphtheria, and scarlet fever, based on 100 cities, 1924*

	Typhoid fever			Diphtheria			Scarlet fever		
	Re- quired	Not re- quired or ad- vised	No data	Re- quired	Not re- quired or ad- vised	No data	Re- quired	Not re- quired or ad- vised	No data
Group I.....	11	1	0	11	1	0	11	1	0
Group II.....	1	15	0	13	2	1	13	2	1
Group III.....	42	7	1	43	7	0	47	3	0
Group IV.....	20	2	0	20	2	0	20	2	0
All cities.....	74	25	1	87	12	1	91	8	1

It will be noted that the percentage of all cities requiring concurrent disinfection has risen between 1920 and 1924 from 66 to 74 per cent in regard to typhoid fever, from 59 to 87 per cent in diphtheria, and from 60 to 91 per cent in scarlet fever.

GASEOUS DISINFECTION

In spite of the oft-repeated evidence of the practical futility of gaseous disinfection as a resource in destroying the bacterial agents and viruses of the notifiable communicable diseases, under the conditions prevailing in the rooms and premises of patients isolated at home, we still have to record a considerable number of municipalities where money, time, and public confidence are sacrificed on the altar of this almost superstitious worship of burnt incense.

In Table XI the facts, as revealed from the answers of the four groups of cities, are set forth. It is a matter of amazement to find that 46.3 per cent of all cities in 1923 still required gaseous disinfection after diphtheria and 48.9 per cent after scarlet fever, although there is real satisfaction in the fact that in 1920 the comparable figures were 64.2 and 66.7 per cent, respectively. The practice is gradually but all too slowly giving way before the reasonableness of the evidence offered by those cities where it has been abandoned without sacrificing any elements of safety or progress in the administrative supervision of the communicable diseases.

How much of this practice, an example of sanitary retardation, is due to fear by the health officer of public opposition to its abandonment, can only be imagined, but it does little credit to the courage or confidence of any health officer or board of health, in the evidence easily obtained from published reports and by personal evidence or demonstration, that he should continue a sham precaution to please the laity.

TABLE XI.—*Number of cities, and percentage they form of all cities reporting, which use gaseous terminal disinfection, by groups*

	Group I		Group II		Group III		Group IV		All cities	
	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent
Typhoid fever.....	1	8	1	6	7	15	6	27	15	16
Diphtheria.....	3	10	7	47	22	44	13	59	45	46
Scarlet fever.....	3	27	7	47	24	48	14	64	48	49
Smallpox.....	7	70	10	66	31	63	16	73	64	67
Measles.....	0	0	1	7	5	1	3	14	9	9
Mumps.....	0	0	0	0	3	6	1	0.4	4	4
Chicken pox.....	0	0	0	0	4	9	1	0.4	5	5
Whooping cough.....	0	0	0	0	3	6	1	0.4	4	4
Meningitis.....	1	8	5	33	18	37	9	41	33	34
Poliomyelitis.....	3	25	5	33	19	39	8	36	35	36
Influenza.....	0	0	1	7	4	11	1	6	6	8
Pneumonia.....	0	0	0	0	3	8	1	6	4	5
Tuberculosis.....	6	50	5	33	15	33	9	41	35	37

Gaseous terminal disinfection or fumigation has a valuable place among the resources for control of communicable diseases, namely, in the destruction of insects and vermin capable of direct or indirect transmission of the virus or bacteria of a disease as simple mechanical vectors or by the means of inoculation through skin puncture. The destruction of mosquitoes, fleas, bedbugs, roaches, flies, lice, rats, mice, and other vermin can be carried out safely and effectively by gaseous fumigation of the immediate chamber of the patient, and sometimes necessarily also of the adjacent rooms and even neighboring dwellings. Use of terminal fumigation, or more exactly gaseous disinfection, is desirable and to be recommended after death or release of the patient in cases of malaria, yellow fever, plague, typhus fever, and a few others under appropriate conditions, but it is valueless as a measure of control in infections passed mainly by transfer of discharges of the respiratory or intestinal tracts, viz, scarlet fever, diphtheria, pneumonia, typhoid fever, in which diseases concurrent disinfection of the discharges is the chief and most useful procedure to employ.

TERMINAL CLEANSING

There is no change of importance in the extent to which terminal cleansing is required by the various groups of cities. The differences between the records as shown (in Table XII) now and in the previous report are neither numerous nor significant.

Here again we find that good practice is followed in a higher proportion of the cities of the first group than is the case with any other group.

In this connection it is worth mentioning the requirement of renovation, or resurfacing with plaster, paint, paper, varnish, calcimine,

or otherwise, the walls and ceiling, and repairing broken flooring and woodwork in premises wherein terminal cases of tuberculosis have been cared for. This is essentially a modification or extension of the principle of terminal cleansing made to fit certain conditions, less apt to be found in dealing with the acute communicable diseases than where the patient has been bed-ridden for a long period before death.

TABLE XII.—*Number of cities which reported (1924) that terminal cleansing is required or advised after certain specified diseases, by groups*

	Group I (12 cities)	Group II (16 cities)	Group III (50 cities)	Group IV (22 cities)	All cities (100 cities)
	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Per cent of total reporting</i>
Typhoid fever.....	7	9	¹ 30	16	63
Diphtheria.....	7	8	22	13	52
Scarlet fever.....	7	8	28	12	56
Smallpox.....	3	6	26	11	49
Measles.....	7	5	12	9	34
Mumps.....	4	4	9	6	24
Whooping cough.....	5	6	13	6	31
Chicken pox.....	5	5	13	6	30
Meningitis.....	7	7	26	18	59
Poliomyelitis.....	7	8	27	12	56
Influenza.....	5	2	9	6	28
Pneumonia.....	4	4	10	5	29
Tuberculosis.....	7	8	26	13	58

¹ Many cities use both methods.

HOSPITALIZATION

In Tables XIII and XIV will be found the number of beds in each city specifically provided for hospital care of the acute communicable diseases, the ratio of the population to each such bed, and the total number of patients suffering from these diseases who were admitted to hospital care during the year 1923, so far as these facts have been reported by the several cities.

The records do not permit the calculation of percentages of cases of the various diseases reported to the health department which were admitted for hospital care, as was given in Table VI, in Public Health Bulletin No. 136, the first report of the committee. Table XIV gives all the information provided for 1923.

The number of beds reported as provided are understood to represent the normal capacity of the hospitals or wards devoted exclusively to the care of the notifiable acute communicable diseases. In most cities, an emergency or crisis expansion capacity of considerable extent could be provided.

TABLE XIII.—Hospital beds provided for acute communicable diseases and their use as reported for 1923 in 87 cities (special smallpox hospitals not included)

City	Number of beds provided	Population per bed	Number of patients admitted	Patients per bed per annum
GROUP I				
Baltimore.....	50	15,472	620	12.4
Boston.....	568	1,356	3,247	5.7
Buffalo.....	135	3,976	863	6.4
Chicago.....	265	10,894	3,020	11.4
Cleveland.....	250	3,554	1,870	7.5
Detroit.....	356	2,797		
Los Angeles.....	45	14,992		
New York.....	4,752	1,247	11,481	2.4
Philadelphia.....	1,200	1,602	4,546	3.7
Pittsburgh.....	240	2,585	1,656	6.9
St. Louis.....	250	3,216	1,247	4.9
San Francisco.....	60	8,984	1,449	24.1
Total.....	¹ 8,171	¹ 2,232	² 29,999	² 3.8
GROUP II				
Cincinnati.....	150	2,709	706	4.7
Columbus.....	25	10,443	65	2.6
Denver.....	75	3,628	602	8.0
Indianapolis.....	90	3,808		
Jersey City.....	165	1,873	302	1.8
Kansas City, Mo.....	105	3,351	624	5.9
Milwaukee.....	190	2,550	1,502	7.9
Minneapolis.....	163	2,509	8,070	48.7
Newark.....	387	1,134		
New Orleans.....	114	3,601	283	2.5
Portland, Oreg.....	75	3,648	364	4.8
Rochester.....	125	2,542	473	3.8
Seattle.....	75	4,209	710	9.4
Toledo.....	62	4,328	3,983	64.2
Washington.....	140	3,399		
Total.....	³ 1,941	³ 2,747	⁴ 17,684	⁴ 13.3
GROUP III				
Akron.....	16	13,027	78	4.9
Albany.....	40	2,944		
Atlanta.....	150	1,486		
Birmingham.....	10	19,590	43	4.3
Bridgeport.....	150	957	656	4.4
Cambridge.....			326	
Camden.....	120	1,034	335	2.8
Dallas.....	65	2,804	191	2.9
Dayton.....	45	3,678		
Des Moines.....	70	2,013		
Duluth.....			244	
Elizabeth.....	75	1,388	120	1.6
Erie.....	16	7,036	165	10.3
Fall River.....	39	3,100	178	4.7
Flint.....	12	9,831	198	16.5
Fort Worth.....	24	5,992	33	1.4
Grand Rapids.....	120	1,216	302	2.5
Hartford.....	105	1,444	265	2.5
Houston.....	38	4,070	240	6.3
Jacksonville.....	32	3,264		
Lowell.....	27	4,262	69	2.5
Lynn.....	48	2,139	222	4.6
Memphis.....	52	3,270		
Nashville.....	35	3,461	24	.7
New Bedford.....	80	1,633		
New Haven.....	94	1,840	662	7.6
Norfolk.....	80	1,989	1,338	17.3
Oakland.....	35	6,859		
Oklahoma City.....	65	1,555	140	2.1
Omaha.....	90	2,271	308	3.4
Paterson.....	145	962	353	2.4
Providence.....	140	1,731	1,108	7.9
Richmond.....	12	15,087	36	3.0
St. Paul.....	725	334	9,893	13.6
Salt Lake City.....	60	2,104	83	1.3
San Antonio.....	30	6,158		
Scranton.....	45	3,123	184	4.0
Spokane.....	90	1,162	434	4.8
Springfield.....	38	3,769	138	3.6
Syracuse.....	106	1,731	713	6.7

¹ 12 cities, 7,770 beds, omitting Detroit and Los Angeles.
² 10 cities.

³ 15 cities.
⁴ 12 cities.

TABLE XIII.—Hospital beds provided for acute communicable diseases and their use as reported for 1923 in 87 cities—Continued

City	Number of beds provided	Population per bed	Number of patients admitted	Patients per bed per annum
GROUP III—Continued				
Tacoma.....	60	1,657	289	4.8
Trenton.....	80	1,592	359	4.5
Utica.....	80	1,331		
Wilmington.....	20	5,886	159	7.9
Worcester.....	125	1,535	488	3.9
Yonkers.....	100	1,075	286	2.9
Youngstown.....	18	8,357		
Total.....	⁵ 3,607	⁵ 1,875	⁶ 20,090	⁷ 6.7
GROUP IV				
Bayonne.....	125	603	95	.8
Canton.....	20	4,955	8	.4
Harrisburg.....	30	1,379	3	.1
Lawrence.....	19	5,177		
Manchester.....	55	1,479	184	3.3
Peoria.....	20	1,811	50	2.5
St. Joseph.....	18	1,863	64	3.5
San Diego.....	96	907	459	4.8
Savannah.....	6	2,982	12	2.0
Schenectady.....	32	3,086	71	2.2
Sioux City.....	30	2,655		
Somerville.....	83	1,191	227	2.7
South Bend.....	12	5,489	36	3.0
Waterbury.....	70	1,406		
Wichita.....	20	3,963	8	.4
Wilkes-Barre.....	12	6,355		
Total.....	⁸ 648	⁸ 2,141	⁹ 1,217	⁹ 2.3
All cities.....	¹⁰ 14,367	¹⁰ 2,145	¹¹ 68,990	¹² 5.5

⁵ 45 cities.⁶ 34 cities.⁷ 34 cities, based on 2,975 beds.⁸ 16 cities.⁹ 12 cities.¹⁰ 88 cities.¹¹ 68 cities.¹² 64 cities.

TABLE XIV.—*Number and percentage of certain notifiable diseases hospitalized in 66 cities reporting on hospitalization, showing also number of beds and population per bed for 88 cities, by groups, 1923*

	Hospital beds provided in 88 cities			Cases of notifiable diseases reported and hospitalized in 66 cities					
	Num-ber of cities report-ing	Num-ber of isola-tion beds pro-vided	Popu-lation per bed	Num-ber of cities report-ing	Number of cases reported	Num-ber of cases hos-pital-ized	Per-centage of cases hos-pital-ized	Num-ber of isola-tion beds pro-vided	Pa-tients per bed per an-num
Group I.....	¹ 11	5,421	3,074	² 10	{ 156,006 *(178,882)	28,067	17.9	5,065	5.5
Group II.....	16	1,749	3,196	³ 11	{ 48,003 (82,429)	13,299	27.7	1,152	11.5
Group III.....	⁴ 46	3,265	2,043	⁵ 34	{ 83,155 (114,590)	18,614	22.4	2,517	⁶ 7.2
Group IV.....	⁷ 15	600	2,184	⁸ 11	{ 15,671 (28,641)	973	6.2	468	2.1
All cities.....	⁹ 88	11,035	2,740	66	{ 302,795 (404,542)	60,953	20.1	9,202	6.6

*The figures in parentheses show total cases of five diseases—typhoid fever, diphtheria, scarlet fever, whooping cough, and measles—reported from all the cities in the group, the other figure giving the cases of these diseases reported in the cities which gave information on hospitalization.

Superior-figure references indicate names of cities omitted for lack of data.

¹ Los Angeles.

² Detroit and Los Angeles.

³ Indianapolis, Louisville, Newark, Toledo, and Washington.

⁴ Cambridge, Duluth, Oakland, and Richmond.

⁵ Albany, Atlanta, Bridgeport, Dayton, Des Moines, Jacksonville, Kansas City, Kan., Memphis, New Bedford, Oakland, Salt Lake City, San Antonio, Reading, Tulsa, Utica, and Youngstown.

⁶ In addition to (5) exclude Cambridge, Duluth, and Richmond.

⁷ Allentown, El Paso, Evansville, Fort Wayne, Knoxville, South Bend, and Troy.

⁸ In addition to (7) exclude Peoria, Sioux City, Waterbury, and Wilkes-Barre.

⁹ Population of the 88 cities, 30,236,615.

Information is lacking for Detroit and Los Angeles as to hospital admissions, among first-group cities; for Indianapolis, Louisville, Newark, and Washington of the second group; for Albany, Atlanta, Dayton, Des Moines, Jacksonville, Kansas City, Kans., Memphis, New Bedford, Oakland, Reading, Richmond, Salt Lake City, San Antonio, Tulsa, Utica, and Youngstown, of the third group; for Allentown, El Paso, Evansville, Fort Wayne, Lawrence, Knoxville, Troy, Waterbury, and Wilkes-Barre, of the fourth group. Furthermore, the number of hospital beds provided was not given for Cambridge, Duluth, Kansas City, Kans., Reading, and Tulsa of the third group, and for Allentown, El Paso, Evansville, Fort Wayne, Knoxville, and Troy of the fourth group.

It will be seen that the number of the population served per hospital bed varies widely in each group of cities from 1,356 (Boston) to 15,472 (Baltimore) per bed, in the first group; from 1,134 (Newark) to 10,443 (Columbus), in the second group; from 957 (Bridgeport) to 15,087 (Richmond), and 19,590 (Birmingham), in the third group; and from 603 (Bayonne) to 5,489 (South Bend), in the fourth group.

The ratio for the 87 cities reporting upon this item with a total population of 30,822,858, was 2,145 population for each hospital bed provided for the acute communicable diseases. Probably one bed for each 2,000 of the population should be provided and would be used if pains were taken to give a high-grade service in which people have pride and confidence as is the case in Providence, R. I.

The smaller cities evidently provide excessively for hospitalization of communicable diseases as can be seen from a study of the number of patients per bed per annum, which is for—

	Patients per bed
Group I cities-----	3.8
Group II cities-----	13.3
Group III cities-----	6.7
Group IV cities-----	2.3

with a combined experience for the 66 cities, reporting upon this item of 5.5 patients per bed per annum.

The uneconomical use of the beds which are provided suggests among other things the very great advantage of having provision for communicable diseases included under the administration of a general hospital so that in periods of low incidence of communicable diseases a part of the beds set aside for this purpose could be used for general medical and surgical patients.

Allowing three weeks as the average length of bed care for the diseases in question (Willard Parker Hospital, New York City, experience 1919–1924, inclusive, was 33.2 days for scarlet fever, 17.2 for diphtheria, and 15.7 for measles), we see that the beds in the cities (10) of the first group were probably used not more than 80 days each out of a possible 365 in the year, or 22 per cent of their capacity; those of the second group (12) were probably used as much as 279 days, or to 76 per cent of their capacity, which is an unusually good performance for even general hospitals; those of the third group (31) were probably used for not more than 140 days, or 38 per cent of their capacity; those of the fourth group (10 cities) were probably used not more than 48 days each in the year, or 13.1 per cent of their capacity; and for the 64 cities in the four groups for which the information was available the beds were probably not used for more than 115 days each, during the year, or 31.7 per cent of their capacity.

PREVALENCE OF COMMUNICABLE DISEASES

In Table XV will be found all the information for 1923 which was presented in Tables VIII to XII of the previous report for 1916–1920, and certain additional data assembled for convenience

in close comparison. The number of cases of the five diseases (typhoid, diphtheria, scarlet fever, measles, and whooping cough) are given as reported to the health departments, and following this the case rates per 100,000 population, then the deaths and death rates per 100,000, and in the last column under each disease the case mortality per cent.

These facts are presented for cities under each of the four groups according to their regional geographic location.

Cities included in geographic groups in Table XV

NORTHERN

Group I	Group II	Group III	Group IV
Boston. Buffalo. Chicago. Cleveland. Detroit. New York. Philadelphia. Pittsburgh.	Columbus. Indianapolis. Jersey City. Milwaukee. Minneapolis. Newark. Portland. Rochester. Seattle. Toledo.	Akron. Albany. Bridgeport. Cambridge. Camden. Dayton. Des Moines. Duluth. Elizabeth. Erie. Fall River. Flint. Grand Rapids. Hartford. Lowell. Lynn. New Bedford. New Haven. Omaha. Paterson. Providence. Reading. St. Paul. Scranton. Spokane. Springfield. Syracuse. Tacoma. Trenton. Utica. Wilmington. Worcester. Yonkers. Youngstown.	Allentown. Bayonne. Canton. Evansville. Fort Wayne. Harrisburg. Lawrence. Manchester. Peoria. St. Joseph. Schenectady. Sioux City. Somerville. South Bend. Troy. Waterbury. Wichita. Wilkes-Barre.

CENTRAL

Baltimore. Los Angeles. St. Louis. San Francisco.	Cincinnati. Denver. Kansas City, Mo. Louisville. Washington.	Atlanta. Birmingham. Kansas City, Kan. Memphis. Nashville. Norfolk. Oakland. Richmond. Salt Lake City.	Knoxville. San Diego.
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SOUTHERN

	New Orleans.	Dallas. Fort Worth. Houston. Jacksonville. Oklahoma City. San Antonio. Tulsa.	El Paso. Savannah.
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Owing to incompleteness of information in certain respects from various cities, the following omissions of data from some of the 100 cities are to be noted:

In the third group cities the rates for whooping cough are based on group populations, omitting the population of Bridgeport, as no data on whooping cough was received from this city.

In the fourth group the rates for typhoid fever are based on populations, omitting that of Peoria (no data), and the rates for the other four diseases are based on populations, omitting Peoria and Evansville, for which there were no data on cases reported, and in measles, omitting Schenectady for the same reason.

The classification of the cities is based as in the previous report upon the mean annual temperature, northern cities with a mean temperature of 12° C. or less, central with a mean temperature between 12° and 18° C., and southern cities with a temperature of 18° C. or more.

Typhoid fever.—The same observations which were made of the experience of the cities for the years 1916–1920 can be repeated here, but with this significant addition, that the death rates have fallen for each group of cities, according to size, and for each class according to geographic distribution, the combined rate being 3.6 per 100,000 as compared with 6.53 of the previous report. The rates are higher as we pass from larger to smaller cities and as we move from the northern to the southern groups.

The variation in case mortality from 14.7 in the northern cities of the third group to 21.8 in the southern cities of the second group, probably indicates variations in the incompleteness of reporting cases rather than any essential differences in severity of disease or skill in medical care of patients. The case mortality for all cities is 17.1.

Diphtheria.—The diphtheria death rates are, for each of the four size groups, less than in 1916–1920, and less for the northern and central cities but higher for the southern cities as a class. The death rate for all cities combined has fallen from 20.09 per 100,000 for 1916–1920 to 13.6 for 1923. The northern and central cities have, as classes, higher rates than the southern cities but within the size groups the regularity of difference is less marked.

There are no significant or suggestive differences in the case mortality rates, although the southern cities of Groups III and IV show higher rates than the northern or central cities, an index of incompleteness of reporting in all probability. The uniformity of case mortality rates throughout the groups is rather surprising, the variation being between 4.6 for southern cities of the second group to 9.9 for the southern cities of the fourth group, with a per cent of case mortality for all cities of 6.7.

GROUP IV																									
Northern-----	1,444	30.1	74	5.0	16.7	3,382	2,244.6	208	15.0	6.2	2,583	186.6	36	2.6	1.4	2,42	298	185.3	68	5.5	3.0	3 10,713	833.7	83	6.5
Central-----	75	42.8	13	7.4	17.3	266	152.0	17	9.7	6.4	355	202.5	9	5.1	2.5	916	523.4	27	15.4	2.9	2,421	1,383.4	15	8.6	
Southern-----	394	212.9	76	41.1	19.3	589	318.4	53	28.7	9.9	309	167.0	5	2.7	1.6	737	398.4	84	45.4	11.4	2,153	1,163.8	69	37.2	
Total----	913	49.8	163	8.9	17.9	4,237	242.8	278	15.9	6.6	3,247	186.1	50	2.8	1.5	3,951	226.4	179	10.3	4.6	15,287	928.7	167	10.1	
ALL GROUPS																									
Northern-----	13,899	16.1	627	2.6	16.1	48,129	2,199.2	3,344	13.8	6.9	253,145	219.9	963	4.0	1.8	2,437	866	153.5	1,328	5.5	3.6	3 151,588	629.9	1,867	7.8
Central-----	1,800	30.0	326	5.2	17.5	14,760	235.7	834	13.3	5.6	10,795	165.4	151	2.4	1.5	13,571	216.7	549	8.8	4.0	55,502	886.3	456	7.3	
Southern-----	985	63.2	204	13.1	20.7	2,281	146.3	167	10.7	7.3	1,089	69.8	17	1.1	1.6	2,249	144.2	179	11.5	7.9	6,657	427.0	118	7.6	
Total----	6,744	21.0	1,157	3.6	17.1	65,170	203.7	4,345	13.6	6.7	65,029	203.3	1,136	3.5	1.7	52,906	165.4	2,056	6.4	3.9	213,747	670.3	2,441	7.7	
Total-----																									
1.1																									

¹ Peoria not included.

¹ Peoria not included.
² Peoria and Evansville not included.

³ Peoria, Evansville and Schenectady not included.

⁴ Bridgeport not included.

Scarlet fever.—As in the years 1916–1920, the death rates are uniformly lowest in the southern city classes, and with the exception of the fourth group, where the central cities have a higher rate than either northern or southern cities of this group, the rates falling as we pass from northern to southern cities. For the groups, the rates fall as we pass from larger to smaller cities. The death rate for all reporting cities in 1923 was lower than for 1916–1920, i. e., 3.5 as compared with 4.34. The case incidence similarly is higher in the larger and northern cities, although the northern cities of the first group show a larger case incidence than do the northern cities of either of the other three groups. It is possible that this is related to the more consistent pasteurization of milk supplies in the large northern cities.

The case mortality per cents vary from 1.1 for central cities of Group III to 2.1 for northern cities of Group I and southern cities of Group II and 2.5 for central cities of Group IV. The case mortality rate for all cities reporting is 1.7 per cent and for the cities by regional class 1.8 per cent for northern, 1.5 per cent for central, and 1.6 per cent for southern cities.

Whooping cough.—While the case rates per 100,000 of population vary widely, presumably because of the lack of coincident occurrence of waves of epidemic prevalence of whooping cough in the groups and classes of cities reported upon, the death rates per 100,000 of population, except for the cities of Group IV, were lower in 1923 than in 1916–1920. It must be assumed either that unusual incompleteness of reporting occurred in these cities, or that the disease attacked chiefly children of the first two years of life. It is to be especially noted that among these southern cities of the fourth group the case mortality also is several times as high as that of any other group or class, 11.4 per cent. The death rate for all reporting cities in 1923 was 6.4 per 100,000 of population as compared with 9.33 for the cities reporting in 1916–1920.

The variations in the case mortality per cents are considerable and can not be grouped under any general statement. For all cities which gave the necessary data the combined case mortality per cent of 3.9 is more than twice of scarlet fever, 1.7.

Measles.—The notorious unreliability or incompleteness in notification of measles cases would lead us to expect much variation among the death rates in any given year in such widely separated cities, whether grouped according to size or classified by climatic conditions, i. e., temperature regions. That this is the case is easily read from the table, rates ranging from 1.7 in third-group southern cities to 37.2 in southern cities of the fourth group. The variation among the three regional classes is surprisingly small, however—from 7.3 in the central to 7.6 in the southern and 7.8 in the northern

cities—these rates and those for all reporting cities being lower than the comparable rates in 1916–1920.

The case mortality per cents with two exceptions show no extreme variations, the exceptions being the rates for southern cities in the second and fourth groups of cities. These high and probably fallacious rates may be due to incompleteness of reporting or a high attack rate among young children.

DISCUSSION

Performance, application in practice in the function of communicable-disease control, lags far behind the well-established and fundamental facts of the medical sciences upon which administration of this primary public-health activity depends. Supplementary or supporting action in this field is properly considered unsuitable for private health agencies. The entire burden of incompleteness, inaccuracy, inconsistency in the regulations, and their enforcement for control of these diseases falls properly upon the health officer.

Organization, personnel, and financial provision leave little to be desired, or at least are not the essential factors in the failure of performance in the many communities where this is quite evident. The professional qualifications and the undivided attention of the health officer or of his assistant in charge of this health service are the elements determining high quality work where this is found.

There is widespread negligence among physicians in the reporting of the notifiable diseases, and all the resources of the health officer by education and legal pressure are rarely used to correct this abuse of indifference and neglect of responsibility to the public.

Even with the cases which are reported, the health department often makes so superficial and intermittent a use of the opportunities to trace sources of infection and means of distribution as to discourage those physicians who are prompt and conscientious with their notifications, while isolation is but very unevenly enforced or taught by visits of supervision and instruction to patients cared for in their homes.

The most obvious absurdity, which can not fail to react unfavorably upon the public's faith in the scientific principles of health practice, is the wide variation in the periods of isolation required in cases of scarlet fever, measles, mumps, chicken pox, whooping cough, and poliomyelitis, even in neighboring cities. The unfortunate part of this is that in practically all instances the shorter periods are approved by competent authority based upon excellent clinical and laboratory evidence, and it is by the reasonableness and not through the severity of regulations that the cooperation of the medical profession and the lay public is to be obtained.

Health officers would do well to see that their practice does not vary substantially in this respect from the suggestions contained in the report of the committee on communicable disease control of the American Public Health Association.

In spite of the general feeling of disappointment and chagrin at the failure of health practice to approach more nearly a reasonable and practicable ideal performance, there is to be recorded in typhoid fever a widespread and consistent reduction in incidence and death rate; in diphtheria, similarly, a substantial reduction in the death rate per 100,000 population; for scarlet fever, a moderate but quite general fall in the death rate; for whooping cough a very considerable fall in the death rate; for measles also a drop as compared with the combined experience of the years 1916-1920, all of which evidence lends strength to the opinion, which one acquires in studying the reports of the cities for 1920 and 1923, that improvement in personnel, method, and results has occurred in spite of the fallacy inherent in any claim of causal relationship between procedures of health departments at any particular time and the incidence or death rates from the communicable diseases for the year in question.

The health department practice at the moment which leaves us aghast is the persistence in so many cities of the futile procedure of gaseous fumigation as a gesture of terminal disinfection.

A GOOD BUREAU OF COMMUNICABLE DISEASES

So far as this fraction of a good health department is intended to deal with the acute communicable diseases, the types of activity outlined under "A. Division of Epidemiology," in the previous report of the committee (pp. 255-257), require no repetition or important modification unless it be under heading (b), which deals with the investigation of reported cases and in the matter of hospitalization. With regard to measles it is believed that the investigation of each case is probably impracticable as well as unprofitable when a widespread epidemic is under way, especially in closely packed tenement populations of our large cities.

Instruction for the observance of isolation should be the main, if not the only, object of visits by all visiting agents of the health department in measles when it is prevalent. The very multitude of cases and the impracticability of investigating profitably each one makes it unsuitable to urge this in the case of measles as it should be in all other diseases.

Reference to Tables XIII and XIV shows the extent of hospitalization of communicable diseases and the percentage of use of hospital beds specifically provided for this purpose.

In the face of present-day housing standards, convenience of sanitary equipment in the homes, and availability of visiting nurses, it is most unlikely that there will be commonly needed or demanded in American municipalities the annual sum of 40 cents per capita for the hospitalization of the notifiable acute communicable diseases under discussion.

Until the standards of management in municipal hospitals and the quality of clinical service for the sick improves to such an extent that people willingly accept for their children bed care in an isolation ward of a general hospital or in a special hospital for communicable diseases, we need hardly urge upon a community the appropriation of so large a sum for this purpose as a necessary item in a budget request for health purposes.

The sum suggested in the previous report for the salaries and maintenance of epidemiological service and control for the acute communicable diseases, in addition to the provision of nurses as elsewhere discussed, is still appropriate and adequate for a good quality and quantity of health work in this function. According to the size of the city the cost of this service is likely to vary, even when well done, between 8 cents per capita in the smaller cities to 12 cents in the larger cities.

V. HOSPITALS AND DISPENSARIES

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The first report of the committee on municipal health department practice, published in 1923 as Public Health Bulletin 136 by the United States Public Health Service, contains no chapter dealing with hospitals and dispensaries as part of municipal health department practice.

Chapter II of Bulletin 136, dealing with "Expenditures of health departments," presents several tables (cf. pp. 47-48) in which the cost for hospital service is included, and Chapter III on "Control of communicable diseases" (cf. pp. 83-84) similarly contains tables giving the number of beds available for the care of communicable disease cases. Dispensary or clinic service is touched upon in the chapter dealing with tuberculosis and the venereal diseases, respectively.

However, the \$2 per capita budget which was presented in Bulletin No. 136 for "a health department competent to deal adequately * * * with the fundamental problems of municipal health administration" does not include the cost item of hospitalizing cases of communicable disease.

In the present report the committee deemed it wise to include a chapter that would deal separately with the present practice of municipal health departments in regard to communicable disease hospitals and dispensaries for relief of the poor. The data presented in the following chapter are taken from material supplied by the United States Public Health Service and essentially represent conditions and findings for the year 1923. In some instances information for the years 1924 and 1925 has been made available. Altogether the practice of 100 cities has been reviewed in the present study, which, for the purpose of convenience and comparison, has placed these cities in four groups of population, viz: 500,000 and over; 250,000 but less than 500,000; 100,000 but less than 250,000; 70,000 but less than 100,000.

HISTORICAL

Hospitalization of cases of communicable disease in this country dates back perhaps to 1675, when Boston and Salem adopted regulations for the isolation and housing of smallpox. In 1701 the Colony of Massachusetts provided for the "impressment" of houses for the isolation and care of smallpox. This act also required the furnishing of nurses and other attendants.

Altogether, however, the development in this country of hospitals for the care of communicable diseases was of slow growth. For

nearly 200 years smallpox remained practically the only disease for which special hospitals were provided:

As late as 1873 New York City maintained, besides its smallpox hospital, only two isolation wards on Blackwells Island—principally for the care of typhus fever. The hospital for communicable diseases other than smallpox is an institution of comparatively recent time, with a history of development of scarcely 25 years.

NUMBER OF HOSPITAL BEDS

Of the 100 cities reviewed, 36 report hospital bed provision for communicable diseases in conformity with or better than the standard of "one bed per 2,000 population" proposed in the 1923 report of the committee on municipal health department practice.

Five cities¹ provide one bed for less than each 1,000 population. In 31 cities² the provision is one bed for each 1,000 to 2,000 of population. Eighteen cities³ show a ratio of one bed for each 2,000 to 3,000 of the population. Twenty-three cities⁴ give a ratio of one bed for each 3,000 to 5,000 population; 11 cities⁵ a ratio of one bed for each 5,000 to 10,000 population. In four cities⁶ one bed is provided for each 10,000 to 15,000, and in three other cities⁷ the ratio is one bed to 15,000 or more of the population.

For three cities (Fort Wayne, Louisville, and Troy) the number of beds is not reported. One city with a population of more than 100,000 (Kansas City, Kans.) reports "no beds available," and another (Cambridge), "beds as required." The extremes in the provision of hospital beds for communicable diseases are represented by Bayonne, with one bed for each 603 population, and Baltimore, with one bed for each 15,471.

TABLE I.—*Cities having available for communicable diseases one bed per specified population group, 1923*

Population for which one bed is available	Number of cities	Population for which one bed is available	Number of cities
Total-----	100	5,000 but under 10,000-----	11
Less than 1,000-----	5	10,000 but under 15,000-----	4
1,000 but under 2,000-----	31	15,000 and over-----	3
2,000 but under 3,000-----	18	Number of beds not reported-----	3
3,000 but under 5,000-----	23	No beds available-----	1
		Beds available "as required"-----	1

¹ Bayonne, Bridgeport, Knoxville, Manchester, Paterson.

² Albany, Atlanta, Boston, Camden, Elizabeth, El Paso, Evansville, Grand Rapids, Hartford, Jersey City, Lawrence, Memphis, Newark, New Bedford, New Haven, Norfolk, Oklahoma City, Peoria, Philadelphia, Providence, Reading, St. Joseph, San Diego, Somerville, Spokane, Syracuse, Tacoma, Trenton, Utica, Waterbury, Worcester.

³ Cincinnati, Dallas, Des Moines, Detroit, Harrisburg, Lowell, Lynn, Milwaukee, Minneapolis, New York, Omaha, Pittsburgh, Rochester, Salt Lake City, Savannah, Sioux City, St. Paul, Tulsa.

⁴ Buffalo, Canton, Cleveland, Dayton, Denver, Erie, Fall River, Houston, Indianapolis, Jacksonville, Kansas City (Mo.), Nashville, New Orleans, Portland, St. Louis, Schenectady, Scranton, Seattle, Springfield, Toledo, Washington, Wichita, Youngstown.

⁵ Akron, Allentown, Duluth, Flint, Fort Worth, Oakland, San Antonio, San Francisco, South Bend, Wilkes-Barre, Wilmington.

⁶ Chicago, Columbus, Los Angeles, Yonkers.

⁷ Baltimore, Birmingham, Richmond.

Cities of the South generally report fewer beds than do cities of the North.

Among the large cities Chicago, Los Angeles, and Baltimore, with only one bed for 10,894, 14,992, and 15,471, respectively, reported for 1923, are conspicuous.

Comparison of the 1921 data presented in Bulletin 136 with the present (1923) material shows a substantial increase in the number of beds for the hospitalization of communicable diseases.

For 74 cities data are available for both 1921 and 1923. The combined population in 1920 in these 74 cities was 27,640,328 and the communicable disease hospital beds in 1921 numbered 8,545, giving a ratio of one bed to each 3,235 of population. In 1923 the population for these cities totaled 29,411,543 and the number of beds 11,085, giving a ratio of one bed for each 2,654 of population. This gives an increase of 21.8 per cent.

In the first group of cities, having a population of 500,000 or more, seven report an increase in the number of beds. New York and Philadelphia nearly doubled their number of beds, and in Cleveland the bed capacity has nearly tripled.

Los Angeles, Chicago, and San Francisco show decreases in the number of beds controlled by their respective health departments. For Baltimore and Buffalo the number of beds has remained the same. The ratio per population, however, shows a slight loss, due to the growth of the city.

The cities in this group had a combined population of 16,377,225 in 1920 and a total of 4,273 beds for communicable diseases, making a ratio of one bed for each 3,833 of population. In 1923 the combined population was 17,340,168, the number of hospital beds 5,761, and the ratio one bed for each 3,010 per population—an increase of 27.3 per cent.

TABLE II.—*Number of beds available for communicable diseases in each city of 500,000 population and over, and the population per available bed; 1921 and 1923*

City	1921		1923	
	Beds	Popula- tion per bed	Beds	Popula- tion per bed
Baltimore, Md.....	50	14, 677	50	15, 471
Boston, Mass.....	484	1, 546	568	1, 356
Buffalo, N. Y.....	135	3, 754	135	3, 976
Chicago, Ill.....	586	4, 610	265	10, 894
Cleveland, Ohio.....	100	7, 968	275	3, 231
Detroit, Mich.....	340	2, 923	356	2, 797
Los Angeles, Calif.....	70	8, 238	45	14, 992
New York City.....	1, 339	4, 197	2, 317	2, 127
Philadelphia, Pa.....	750	2, 432	1, 200	1, 602
Pittsburgh, Pa.....	165	3, 566	240	2, 068
San Francisco, Calif.....	80	6, 333	60	8, 984
St. Louis, Mo.....	174	4, 442	250	3, 215

The second group of cities, with a population of 250,000 to 500,000, shows an increase for seven cities and a decrease for six. In this group the most marked growth noted is in New Orleans, where the number of beds increased from 48 in 1921 to 114 in 1923. Jersey City and Indianapolis both more than doubled their bed capacity.

The combined population for the cities in this group in 1920 was 4,542,763; the number of beds 1,506; the population per bed 3,016. In 1923 this group had a population of 4,802,047 and 1,854 beds. The population per bed was 2,590, making an increase for this group of 16.4 per cent.

TABLE III.—*Number of beds available for communicable diseases in each city of 250,000 to 500,000 population, and the population per available bed; 1921 and 1923*

City	1921		1923	
	Beds	Popula- tion per bed	Beds	Popula- tion per bed
Cincinnati, Ohio.....	150	2,675	150	2,709
Denver, Colo.....	70	3,664	75	3,627
Indianapolis, Ind.....	40	7,854	90	3,808
Jersey City, N. J.....	80	3,726	165	1,873
Kansas City, Mo.....	180	1,802	105	3,351
Milwaukee, Wis.....	139	3,289	190	2,556
Minneapolis, Minn.....	170	2,239	163	2,509
Newark, N. J.....	240	1,727	387	1,133
New Orleans, La.....	48	8,067	114	3,549
Portland, Oreg.....	75	3,444	75	3,648
Rochester, N. Y.....	125	2,366	125	2,543
Seattle, Wash.....	75	4,204	75	4,209
Washington, D. C.....	114	3,838	140	3,400

Out of the 58 cities in the third group, having a population of 250,000 or less, 30 cities⁸ show an increase, and 18⁹ a decrease in bed capacity. For one city¹⁰ the ratio remains the same. For seven¹¹ comparative data are not available, and for two¹² no report is submitted. The most remarkable increase in the number of beds in this group is reported for two cities of the South—Atlanta, Ga., where the hospital capacity was increased from 30 in 1921 to 150 in 1923, and in Memphis, Tenn., which shows an increase of 18 to 112 for the respective years.

⁸ Atlanta, Bridgeport, Camden, Columbus, Dallas, Dayton, Des Moines, Erie, Grand Rapids, Hartford, Houston, Lawrence, Lowell, Memphis, New Haven, Oakland, Oklahoma City, Omaha, Paterson, Providence, Richmond, Salt Lake City, San Antonio, San Diego, Scranton, Somerville, Tacoma, Utica, Worcester, Yonkers.

⁹ Albany, Canton, Duluth, Elizabeth, Fall River, Flint, Jacksonville, Lynn, New Bedford, Norfolk, Schenectady, Spokane, Springfield, St. Paul, Syracuse, Toledo, Trenton, Wilmington.

¹⁰ Akron.

¹¹ Birmingham, Fort Worth, Louisville, Nashville, Reading, Savannah, Youngstown.

¹² Cambridge, Kansas City (Kans.).

TABLE IV.—*Number of beds available for communicable diseases in each city having in 1920 less than 250,000 population; 1921 and 1923*

City	1921		1923	
	Beds	Popula- tion per bed	Beds	Popula- tion per bed
Akron, Ohio.....	26	8,017	26	8,017
Albany, N. Y.....	100	1,133	90	1,304
Atlanta, Ga.....	30	6,687	150	1,486
Birmingham, Ala.....			13	15,069
Bridgeport, Conn.....	120	1,196	150	957
Camden, N. J.....	50	2,326	120	1,035
Canton, Ohio.....	20	4,355	20	4,955
Columbus, Ohio.....	12	19,753	25	10,443
Dallas, Tex.....	20	7,949	65	2,804
Dayton, Ohio.....	30	5,085	40	3,941
Des Moines, Iowa.....	20	6,323	70	2,013
Duluth, Minn.....	36	2,748	17	6,252
Elizabeth, N. J.....	100	958	87	1,196
Erie, Pa.....	20	4,669	32	3,518
Fall River, Mass.....	48	2,510	35	3,455
Flint, Mich.....	12	7,633	12	9,831
Fort Worth, Tex.....			24	5,993
Grand Rapids, Mich.....	80	1,720	120	1,216
Hartford, Conn.....	63	2,191	105	1,449
Houston, Tex.....	30	4,609	38	4,078
Jacksonville, Fla.....	32	2,861	32	3,126
Lawrence, Mass.....	10	9,427	54	1,802
Louisville, Ky.....	48	4,894		
Lowell, Mass.....	27	4,176	47	2,449
Lynn, Mass.....	75	1,322	48	2,139
Memphis, Tenn.....	18	9,020	112	1,518
Nashville, Tenn.....			35	3,461
New Bedford, Mass.....	76	1,595	80	1,633
New Haven, Conn.....	75	2,167	99	1,747
Norfolk, Va.....	150	772	128	1,243
Oakland, Calif.....	30	7,209	35	6,860
Oklahoma City, Okla.....	40	2,282	65	1,556
Omaha, Nebr.....	40	4,790	90	2,271
Paterson, N. J.....	100	1,359	145	963
Providence, R. I.....	120	1,980	140	1,731
Reading, Pa.....			60	1,849
Richmond, Va.....	8	21,458	12	15,087
Salt Lake City, Utah.....	28	4,218	48	2,630
San Antonio, Tex.....	12	13,448	30	6,157
San Diego, Calif.....	60	1,245	60	1,452
Savannah, Ga.....			30	2,981
Schenectady, N. Y.....	32	2,773	32	3,087
Scranton, Pa.....	40	3,445	45	3,124
Somerville, Mass.....	70	1,330	83	1,190
Spokane, Wash.....	100	1,044	90	1,162
Springfield, Mass.....	36	3,600	35	4,121
St. Paul, Minn.....	150	1,565	125	1,935
Syracuse, N. Y.....	129	1,331	106	1,741
Tacoma, Wash.....	40	1,939	60	1,696
Toledo, Ohio.....	85	2,861	62	4,328
Trenton, N. J.....	110	1,084	80	1,592
Utica, N. Y.....	60	1,569	80	1,331
Wilmington, Del.....	34	3,240	20	5,886
Worcester, Mass.....	75	2,397	125	1,535
Yonkers, N. Y.....	87	1,151	100	1,075
Youngstown, Ohio.....			34	4,425

In 1921 this group had a combined population of 6,720,340 with 2,766 beds, or one bed for each 2,321 population. The 1923 data give this group a population of 7,269,328 and 3,470 beds, or one bed for each 2,095 of population. This makes an increase of 15.9 per cent.

TABLE V.—*Beds available for communicable diseases and population per bed in 74 cities of specified size: 1921 and 1923*

	1921			1923			Percent- age of increase
	Population 1920	Number of beds	Popula- tion per bed	Population 1923	Number of beds	Popula- tion per bed	
All cities (74)-----	27, 640, 328	8, 545	3, 235	29, 411, 543	11, 085	2, 654	21. 8
Cities over 500,000 (12)-----	16, 377, 225	4, 273	3, 833	17, 340, 168	5, 761	3, 010	27. 3
Cities 250,000 to 500,000 (13)-----	4, 542, 763	1, 506	3, 016	4, 802, 047	1, 854	2, 590	16. 4
Cities under 250,000 (49)-----	6, 720, 340	2, 766	2, 321	7, 269, 328	3, 470	2, 095	15. 9

COST OF HOSPITAL SERVICE

The cost figures for communicable disease hospitals maintained by health departments were obtained for 60 cities out of the 100 cities surveyed. The combined population for these 60 cities in 1923 was 22,452,396, and the aggregate cost of hospitals maintained by health departments in these cities was \$8,602,298.19. This makes an average per capita cost of \$0.383 for hospital service in these 60 cities reporting.

A few cities, notably Kansas City, Mo., Jersey City, Buffalo, San Francisco, and Minneapolis, show enormous amounts expended for hospitals under the jurisdiction of the health department, thus making the average very high. It seemed best, under the circumstances, to take the median rather than the average cost. This median cost proves to be \$0.123, less than one-third of the average cost.

Extremes in per capita cost expenditures for hospital service are reported by Des Moines, with \$0.005, on the one hand, and Kansas City, Mo., with \$2.128, on the other.

Out of the 60 cities reporting 11¹³ spent less than \$0.05 per capita for hospital service; 11¹⁴ spent between \$0.05 and \$0.10; 17¹⁵ between \$0.10 and \$0.25; 9¹⁶ between \$0.25 and \$0.50; 7¹⁷ from \$0.50 to \$1; and 5,¹⁸ \$1 or more.

Cost figures for both 1921 and 1923 are available for only 45 cities. A comparison of the hospital cost for all of these cities shows a per capita expenditure of \$0.378 in 1921 as against \$0.379 in 1923, an increase of 0.3 per cent.

¹³ Albany, Boston, Columbus, Des Moines, El Paso, Evansville, Los Angeles, New Orleans, St. Paul, Tulsa, Wichita.

¹⁴ Akron, Atlanta, Baltimore, Denver, Erie, Knoxville, Norfolk, Omaha, Salt Lake City, Schenectady, South Bend.

¹⁵ Chicago, Dallas, Duluth, Elizabeth, Milwaukee, New Bedford, Oklahoma City, Peoria, Portland, Rochester, St. Joseph, San Diego, Scranton, Somerville, Spokane, Tacoma, Toledo.

¹⁶ Bridgeport, Cambridge, Camden, Hartford, New York City, Paterson, Pittsburgh, Springfield, Syracuse.

¹⁷ Detroit, Grand Rapids, Lawrence, Lynn, Seattle, Worcester, Yonkers.

¹⁸ Buffalo, Indianapolis, Jersey City, Kansas City (Mo.), San Francisco.

TABLE VI.—*Total and per capita expenditures of health departments for hospital service in 45 cities¹ of specified size; 1921 and 1923*

Size of city	1921			1923			Per cent increase or decrease
	Popula- tion in 1920	Amount expended	Per capita expend- iture	Popula- tion in 1923	Amount expended	Per capita expend- iture	
All cities considered ¹ ...	18, 606, 833	\$7, 026, 904	\$0. 378	19, 769, 541	\$7, 500, 009	\$0. 379	+0.3
Cities having 500,000 popula- tion or more.....	11, 900, 260	4, 215, 307	. 354	12, 513, 649	4, 147, 475	. 331	-6. 5
Cities having 250,000 to 500,000 population.....	2, 908, 839	1, 850, 311	. 636	3, 071, 945	2, 219, 335	. 722	+13. 5
Cities having less than 250,000 population.....	3, 797, 734	961, 286	. 253	4, 183, 947	1, 133, 199	. 271	+7. 1

¹ Data on costs of hospital service are available both for 1921 and 1923 in 45 cities only. Sixty cities, however, reported these data in 1923 and the per capita cost for hospital service in these 60 cities was \$0.383.

For 23 of the cities in this group increases are reported; 22 report a decrease.

In the first group of cities, having a population of 500,000 or more, two (Chicago and Detroit) report an increase, while five (Baltimore, Boston, New York, Pittsburgh and San Francisco) show a decrease in the hospital cost for 1923 as compared with the 1921 expenditures. The largest increase (68.6 per cent) in this group is reported by Detroit; the greatest decrease (68.7 per cent) by Boston. For the entire group a decrease of 6.5 per cent is noted for 1923 as compared with the 1921 expenditures.

TABLE VII.—*Total and per capita expenditures of health departments for hospital service in cities having in 1920, 500,000 population and over; 1921 and 1923*

City	Expenditures for hospital service				Per cent increase or decrease in per capita expenditure
	1921		1923		
	Amount	Per capita	Amount	Per capita	
Baltimore, Md.....	\$47, 176	\$0. 064	\$47, 442	\$0. 061	—4.
Boston, Mass.....	50, 000	. 067	15, 965	. 021	—68.
Buffalo, N. Y.....			1, 058, 473	1. 972	
Chicago, Ill.....	299, 660	. 111	325, 642	. 113	+1.
Detroit, Mich.....	520, 000	. 523	877, 766	. 882	+68.
Los Angeles, Calif.....			11, 014	. 016	
New York City.....	1, 852, 709	. 330	1, 760, 474	. 297	—10.
Philadelphia, Pa.....	3, 205, 246	1. 757			
Pittsburgh, Pa.....	213, 526	. 363	207, 917	. 335	—7.
San Francisco, Calif.....	1, 232, 236	2. 432	912, 269	1. 692	—30.

The second group of cities (population, 250,000 to 500,000) shows a gain for four cities (Jersey City, Kansas City, Mo., Portland, Oreg., and Rochester) and losses for five cities (Denver, Indianapolis, Milwaukee, New Orleans, and Seattle). For the entire group an increase of 13.5 per cent is noted.

TABLE VIII.—*Total and per capita expenditures of health departments for hospital service in cities having, in 1920, 250,000 to 500,000 population; 1921 and 1923*

City	Expenditures for hospital service				Per cent increase or decrease in per capita expenditure
	1921		1923		
	Amount	Per capita	Amount	Per capita	
Denver, Colo.....	\$191,500	\$0.747	\$18,480	\$0.068	—90.9
Indianapolis, Ind.....	346,007	1.101	373,025	1.090	—1.0
Jersey City, N. J.....	435,052	1.459	625,260	2.074	+42.2
Kansas City, Mo.....	382,694	1.180	748,573	2.128	+80.3
Milwaukee, Wis.....	136,477	.299	90,141	.186	—37.8
New Orleans, La.....	35,497	.092	19,673	.049	—48.9
Portland, Oreg.....	10,924	.042	27,556	.100	+138.1
Rochester, N. Y.....	30,720	.104	41,528	.131	+26.0
Seattle, Wash.....	278,440	.883	275,099	.871	—1.4
Washington, D. C.....	36,312	.083			

In the third group of cities (population less than 250,000) for which data are available for both 1921 and 1923, 17 cities (Atlanta, Bridgeport, Cambridge, Camden, Duluth, Elizabeth, Erie, Grand Rapids, Hartford, Lynn, Paterson, San Diego, Spokane, Syracuse, Tacoma, Toledo, Yonkers) show increases in the hospital expenditures for 1923; 12 (Akron, Albany, New Bedford, Norfolk, Oklahoma City, Omaha, Salt Lake City, Scranton, Somerville, Mass., Springfield, Mass., St. Paul, Worcester), a decrease.

TABLE IX.—*Total and per capita expenditures of health departments for hospital service in cities having in 1920 less than 250,000 population; 1921 and 1923*

City	Expenditures for hospital service				Per cent increase or decrease in per capita expenditure
	1921		1923		
	Amount	Per capita	Amount	Per capita	
Akron, Ohio.....	\$15,049	\$0.072	\$13,100	\$0.063	—12.5
Albany, N. Y.....	2,500	.022	2,240	.019	—13.6
Atlanta, Ga.....	11,277	.055	13,031	.058	+5.5
Bridgeport, Conn.....	62,849	.438	64,029	.446	+1.8
Cambridge, Mass.....	32,695	.298	51,888	.466	+56.4
Camden, N. J.....	30,800	.265	52,000	.419	+58.1
Canton, Ohio.....	5,349	.061			
Columbus, Ohio.....			10,707	.041	
Dallas, Tex.....			21,100	.116	
Des Moines, Iowa.....			696	.005	
Duluth, Minn.....	22,300	.225	24,980	.235	+4.4
Elizabeth, N. J.....	11,937	.125	15,009	.144	+15.2
Erie, Pa.....	6,137	.066	7,950	.071	+7.6
Fall River, Mass.....	65,000	.521			
Fort Worth, Tex.....	11,100	.104			
Grand Rapids, Mich.....	52,740	.383	115,910	.794	+107.3
Hartford, Conn.....	60,900	.441	72,632	.477	+8.2
Houston, Tex.....	6,240	.045			
Jacksonville, Fla.....	7,500	.082			
Kansas City, Kans.....	2,000	.020			
Lowell, Mass.....	11,143	.098			
Lynn, Mass.....	59,659	.602	89,069	.868	+44.2
New Bedford, Mass.....	73,206	.604	15,836	.121	—80.0
Norfolk, Va.....	12,661	.109	9,402	.059	—45.9
Oklahoma City, Okla.....	17,315	.190	11,170	.110	—42.2
Omaha, Nebr.....	30,164	.157	16,880	.083	—47.1
Paterson, N. J.....	40,000	.294	53,125	.381	+29.6
Richmond, Va.....	1,891	.011			
Salt Lake City, Utah.....	7,202	.061	7,535	.060	—1.6
San Diego, Calif.....	12,700	.170	17,976	.206	+21.1
Schenectady, N. Y.....			6,406	.065	
Seranton, Pa.....	19,549	.142	17,341	.123	—13.4
Somerville, Mass.....	29,781	.320	18,000	.182	—43.1
Spokane, Wash.....	24,635	.236	25,294	.242	+2.5
Springfield, Mass.....	53,167	.410	53,170	.369	—10.0
St. Paul, Minn.....	14,279	.061	6,194	.026	—67.2
Syracuse, N. Y.....	33,516	.195	51,638	.280	+43.6
Tacoma, Wash.....	13,517	.139	14,245	.140	+0.7
Toledo, Ohio.....	21,360	.088	59,244	.220	+127.3
Worcester, Mass.....	119,868	.667	154,311	.804	—20.5
Yonkers, N. Y.....	69,523	.694	79,982	.744	+7.2
Youngstown, Ohio.....	6,969	.053			

The cities in this group show collectively an increase of 7.1 per cent.

DISPENSARY SERVICE

Reports on dispensary service, or medical relief for the poor, are submitted for 97 cities. No data are available for New York, Detroit, and Reading. Twenty-two types of clinics are listed. Clinics for tuberculosis are maintained in 78 out of the 97 cities reporting. Venereal diseases come next—in 72 cities. Then follow well-baby clinics for 66 cities. “General clinics” are listed 47 times, dental clinics 45 times, and prenatal clinics in 42 cities.

It is interesting to note the relatively large number of psychiatric clinics reported for 28 cities. To this group may be added the behavior and habit clinics listed for 4 cities.

Diphtheria immunization is given as a separate clinical activity in two cities; nutrition work in six; two cities report occupational clinics; and clinics for drug habit, cancer, goiter, diabetes, and child labor are represented by one city each.

TABLE X.—*Type of clinics reported for 97 cities*

General clinics—including medical and surgical.....	47
Pediatric clinics (sick baby).....	22
Eye, ear, nose, and throat clinics.....	32
Dental clinics.....	45
Venereal disease clinics.....	72
Tuberculosis clinics.....	78
Prenatal clinics.....	42
Well-baby clinics.....	66
Preschool children's clinics.....	24
Orthopedic and posture clinics.....	22
Diphtheria immunization clinics.....	2
Psychiatric clinics.....	28
Behavior and habit clinics.....	4
Nutritional clinics.....	6
Others:	
Occupational.....	2
Drug.....	1
"School".....	4
Cancer.....	1
Food handlers.....	2
Goiter.....	1
Diabetic.....	1
Child labor.....	1

DISPENSARY COST

For 59 cities out of the 100 surveyed cost figures are presented. As in the case of hospitals these figures vary from less than \$0.05 to \$1.75 per capita.

Seven cities (Baltimore, Boston, Chicago, Philadelphia, Pittsburgh, San Francisco, and St. Louis) in the group having a population of 500,000 or more show an average per capita expenditure in 1923 of \$0.87. The median is \$0.75; the lowest expenditure in this group is \$0.13, for St. Louis, the highest \$1.75 for Boston.

The second group of cities, population 250,000 to 500,000, includes Cincinnati, Columbus, Denver Indianapolis, Kansas City, Mo., Louisville, Newark, New Orleans, Toledo. The average cost per capita for these nine cities is \$0.075; the median \$0.035; with an expenditure of \$0.01 in Cincinnati as low and \$0.369 in New Orleans as high.

Group III, representing cities having a population from 100,000 to 250,000, includes 32 cities (Albany, Akron, Atlanta, Birmingham, Bridgeport, Cambridge, Elizabeth, Erie, Fall River, Grand Rapids,

Houston, Jacksonville, Lowell, Lynn, Memphis, Nashville, New Bedford, Norfolk, Oklahoma City, Omaha, Paterson, Providence, Richmond, St. Paul, Salt Lake City, Scranton, Spokane, Springfield, Syracuse, Trenton, Tulsa, and Yonkers).

The average per capita cost in this group is \$0.208 with \$0.004 in Scranton, Pa., as low, and \$1.56 in Memphis, Tenn., as high. The median is \$0.065.

The fourth group of cities (population 70,000 to 100,000) is represented by 11 cities (El Paso, Evansville, Fort Wayne, Harrisburg, Lawrence, Peoria, Savannah, Schenectady, Somerville, Troy, and Waterbury). These cities show an average per capita expenditure of \$0.46. In this group El Paso, with \$0.017, represents the low, and Troy, with \$1.67, the high. The median for the group is \$0.139.

The average per capita cost for relief of the poor for the 59 cities in 1923 comes to \$0.31, with the median at \$0.09.

SUMMARY AND DISCUSSION

Hospitalization of communicable diseases and medical relief of the poor are increasingly recognized as necessary and proper health activities.

The standard of "one bed for each 2,000 population" obtains or is exceeded in 36 cities in the group of 100 cities surveyed in the present study. For the combined population of nearly 30,000,000 in 74 cities represented in this group of cities, the hospital-bed-population ratio in 1923 is 1 to 2,654, an increase of 21.8 per cent over 1921.

The decrease in beds reported for some cities is mainly an apparent decrease only, and is accounted for by the transfer of administrative control over communicable-disease hospitals from city health departments to other city or county authorities.

Whether the present standard—of one bed per 2,000 population—will be necessary in the future is open to question. Preventive work, and especially diphtheria and scarlet fever immunization, will undoubtedly materially lessen the incidence of these diseases, which at present claim the largest number of communicable-disease hospital beds. Nevertheless, it seems best to maintain the present standard for the immediate future.

In the meantime it seems desirable to encourage the present tendency to have county hospitals assume the care of communicable diseases. This seems especially advisable for communities having a population of less than 100,000. Where such an arrangement can not be made, contract with private hospitals should be effected if possible.

For cities with a population of more than 100,000 a communicable-disease hospital maintained by the public (city or county) seems to warrant the overhead expense. The cubicle arrangement, rather than large wards, will prove an advantage not only in the control of patients but above all in the greater flexibility of service.

Unfortunately, the data on the cost of hospital service in the material submitted are less complete than those on the number of beds for communicable diseases. For some cities the cost figures include hospital service other than that for communicable diseases. Again it is quite clear that expenditures for building activities are included in some budget figures. Because of these factors, as well as because of the varying incidence in contagious diseases, the comparative cost figures can not be accepted as representing the real maintenance cost.

Thirty-eight cents, which represents the per capita cost for the 60 cities reporting, seems high as purely a maintenance figure. On the other hand, the median of 12 cents per capita seems inadequate. The average per capita cost of 20 cents, for the cities with a population of 100,000 to 250,000, seems best to meet the needs of the city of 100,000 population maintaining a 50-bed hospital. This means a budget of \$20,000 for service maintenance.

The budget for such hospital service is estimated as follows:

Matron.....	\$2, 000
Assistant.....	1, 500
Temporary service.....	3, 600
Cook.....	1, 200
Other help.....	900
Janitor.....	1, 200
Food, fuel, and other service.....	9, 600
Total	20, 000

In this budget medical service is assumed to be rendered by the members of the contagious-disease bureau. The average number of persons per bed, including the hospital staff, is estimated at 15. Obviously, such a budget will be changed by abnormal disease prevalence and fluctuation in price of food, fuel, and personal service. At current prices, the above budget seems to make ample provision.

The data on dispensary practice are unfortunately even less complete than those for hospital service, not only by their obvious omissions but in most instances it is impossible to know whether the service is rendered by the health department or some other governmental or private agency.

The data therefore must be regarded as essentially representing municipal service, with the specific agency not stated. Some of the omissions undoubtedly arise out of a misunderstanding with regard

to the term "dispensary." While Davis and Warner define a "clinic" as a subdivision of dispensary service, the New York State definition, which makes no such distinction, seems to us preferable.

It matters little, finally, under what name or under what agency medical relief to the poor is rendered provided it is furnished. There seems a growing appreciation of the economic importance of dispensary service as a disease-preventing, and therefore monetary-loss-preventing, activity. It is cheaper to render timely service through dispensaries or clinics than to allow a complete breakdown, which may then mean the much more costly hospitalization of the patient.

The average per capita cost for medical relief of the poor for the 59 cities covered in the present study was 46 cents. For the group of cities with a population of 250,000 each the average per capita cost was 22 cents for this service. For a city of 100,000 population a per capita expenditure of 20 cents should provide adequate service.

Dispensary service, whenever possible, should be rendered through the out-patient department of hospitals. However, to be of the greatest value, the hospital as well as the dispensary must be brought close to the people who need the service. The location of either service calls for a careful social survey as the first step in the program.

As a budget for dispensary service in a city of 100,000 population the following is suggested:

Salaries:

Chief, full time-----	\$4,000
Clerk, full time-----	1,200
Nurse, full time-----	1,500
Social worker, full time-----	1,500
Professional services -----	¹⁹ 6,000
Maintenance-----	5,800
Total -----	20,000

The above budget considers maintenance of service only, and does not include the cost of original equipment. While it is recommended that the dispensary is preferably established in connection with some hospital, medical school, or public building so that the cost of housing can be saved, the above estimate provides for rental of quarters.

NOTE.—The statistical tables in this article have been prepared by Miss Mary V. Dempsey, statistician of the Syracuse Health Demonstration.

¹⁹ This item presupposes that the chiefs of bureaus in tuberculosis, infant welfare, pre-natal service, and communicable diseases will be available for clinic service at the dispensary. The service of a full-time dentist at \$2,400 a year is also included in this item.

VI. TUBERCULOSIS

A. Analysis of Provisions Made for the Prevention and Control of Tuberculosis ¹

In all of the 100 large cities, the survey reports for 1923 indicate that some effort was made to prevent the spread of tuberculosis, and to care for those afflicted with this disease, either by State, county, municipal, or private agencies. The extent of these activities can be estimated for some cities only by a comparison of such available data as the expenditure and personnel items charged to this work, the records of clinics, dispensaries, and visiting nurses, and the morbidity and mortality statistics, which, in a measure at least, are an index of the success or failure of efforts to prevent further spread of this preventable health hazard.

The information collected for 1923, although meagre and incomplete in many respects, is sufficient to warrant rather definite conclusions as to the adequacy of community effort in combating this widespread and frequently fatal affliction. In some of the cities with continued excessive mortality from tuberculosis, the antituberculosis activities are, unquestionably, very inadequate. Organized community programs, directed toward the control of this disease, have been essential factors contributing to the great reduction in its yearly ravages that has taken place since the beginning of the present century. The present survey serves to emphasize the need of organized effort and especially the necessity of more adequate and effective preventive methods and ample provisions for the treatment of early and advanced cases. The services now provided by various agencies should be better coordinated, as a rule, and local health authorities should assume leadership in the management of antituberculosis campaigns.

THE DEATH RATE FROM TUBERCULOSIS, AN INDEX OF THE PROBLEM CONFRONTING MUNICIPAL HEALTH AUTHORITIES

On the basis of the number of deaths that occurred in 1923, Table I serves to indicate the average crude death rates per 100,000 population for the large cities grouped according to size. The average rate for the 99 large cities was 99.6, as compared to 93.6 for the entire registration area.

¹ Original analysis prepared by the medical and statistical services of the National Tuberculosis Association under the special direction of Floyd Wilcox, staff member, and later revised and amplified in accordance with the records and data collected in the office of administrative health practice, United States Public Health Service.

TABLE I.—*Total deaths and death rates per 100,000 for tuberculosis (all forms), by population groups, 99 cities,¹ 1923*

Population groups	Number of cities	Total population	Tuberculosis (all forms)	
			Total deaths	Death rate per 100,000 population
Group I.....	12	17,394,500	17,502	100.6
Group II.....	16	5,591,238	5,905	105.6
Group III ¹	49	7,206,416	6,637	92.1
Group IV.....	22	1,914,729	1,924	100.5
99 cities ²	99	32,106,883	31,968	99.6

¹ Tulsa omitted, not in registration area, 1923.

² Populations used correspond to estimates published in Mortality Statistics, 1923, Bureau of Census, with the exception of Detroit, for which estimated population 1923 was based upon 1925 census. For Seattle 1920 census population was increased 373 by annexation. For Akron, Bridgeport, and Troy the 1920 census population was used.

Crude death rates for individual cities showed extreme variations, from 40.2 for Sioux City to 455.7 for El Paso. In Group I, Los Angeles had a (provisional) rate of 182.3; Baltimore, 127.3; San Francisco, 126.1; Cleveland, 91.0; St. Louis, 82.5; Chicago, 81.0. The highest rates in Group II were Denver, 209.5; New Orleans, 174.0; Cincinnati, 133.1; the lowest rates being Milwaukee, 67.5; Rochester, 64.3; Seattle, 63.4. In Group III, San Antonio, 259.3; Jacksonville, 180.9; and Memphis, 178.2, showed the highest rates, while the lowest rates occurred in Springfield, 52.7; Akron, 51.8; and Flint, 43.2. Group IV, for cities under 100,000 population, showed the greatest variations, with El Paso, 455.7; Savannah, 192.3, and San Diego, 158.4; while at the other extreme Wichita had a rate of 46.6, Schenectady 45.5 and Sioux City 40.2.

As a cause of death in 1923, tuberculosis (all forms) accounted for 7.6 per cent of deaths from all causes in the entire registration area, being exceeded only by deaths from cardiac diseases with a crude death rate of 175.3 or 14.3 per cent of all deaths, and influenza and pneumonia (all forms) with a rate of 153.7, or approximately 12.5 per cent of all deaths. Compared to the mortality from other infectious diseases, including all the common epidemic diseases, tuberculosis claimed nearly twice as many lives as did all these other causes of death.

Among the preventable diseases, tuberculosis, therefore, still remains as a public health problem par excellence, in spite of the remarkable reduction that has taken place in the annual death rates during the past two decades. While the average death rate of the cities under consideration is, perhaps, encouraging, 40 of the 100

cities had a mortality that exceeded the average death rate from this disease based upon the registration area. In individual cities the recorded annual mortality from tuberculosis is influenced by factors that are not uniformly effective. The high mortality in some of the Southern cities is due, undoubtedly, largely to racial conditions while the relatively high rates reported for El Paso, Denver, and certain other cities are influenced by the migration of consumptives seeking the possible advantages of local climatic conditions.

TABLE II.—*Mortality from tuberculosis (all forms), 99 cities, 1923, grouped by geographic divisions*

Geographic divisions	Number of cities	Total population	Tuberculosis (all forms)	
			Total deaths	Death rate per 100,000 population
New England.....	16	2, 773, 680	2, 419	87. 2
Middle Atlantic.....	24	11, 946, 226	11, 252	94. 2
South Atlantic.....	8	2, 119, 864	2, 703	127. 5
North Central.....	29	10, 429, 168	8, 965	86. 0
South Central ¹	12	2, 103, 172	3, 265	155. 2
Mountain.....	2	398, 272	654	164. 2
North Pacific.....	4	795, 610	517	65. 0
South Pacific.....	4	1, 540, 891	2, 193	142. 3

¹ Tulsa omitted.

In Table II the 99 cities are arranged according to their geographic location. The New England, North Central and North Pacific groups present average rates lower than the average for the registration area, while the Middle Atlantic group is only slightly in excess of this average. On the other hand the 24 cities in the South Atlantic, South Central and South Pacific groups have rates considerably in excess of the average for the entire group or for the registration area. In the Mountain division Denver had an annual crude death rate of 209.5, while Salt Lake City was credited with the low rate of 66.5.

While the present analysis does not undertake to formulate any conclusions as to the possible effect of geographic, climatic, or other conditions upon the incidence of tuberculosis, the data presented in the foregoing tables are intended merely to indicate the magnitude of the problem confronting public health authorities. Whatever may be the contributing causes to a continued high incidence and mortality from this disease in any selected city or group of cities, the survey for 1923 reveals the fact that municipal authorities have not, as a rule, provided adequate facilities for combating the excessive prevalence of this disease.

LEGAL MEASURES FOR THE PREVENTION AND CONTROL OF TUBERCULOSIS

The public laws under which the prevention and control of tuberculosis are undertaken are, in general, those governing other communicable diseases. The enforcement of the regulatory measures that have been fairly successful in official control of other diseases has, however, met with certain obstacles when applied to this particular disease. For this reason, and because it has become recognized as one of the most serious of all public health problems, the control of tuberculosis has become a rather distinct function and in legislative and administrative provisions special consideration has been given to this disease.

All but one of the 100 large cities required by law, ordinance, or regulation that all cases of tuberculosis be reported to the health department. This disease did not appear among the lists of reportable diseases as early as many of the other notifiable infections, and while it is now rather universally included, the compliance with this legal provision is far from complete or satisfactory as will be shown in a later discussion.

Concurrent disinfection of sputum from tuberculosis patients is prescribed in many health department regulations but this requirement, for the most part, appears to be a responsibility that is incumbent upon the attending physician or those in attendance upon individual cases. Instructive nursing agencies, both official and private, have recognized the importance of this measure and there has been, undoubtedly, an improvement in this essential item of bedside technique among the cases under observation. Without reasonably effective concurrent disinfection, attempts to enforce isolation or to prevent the spread of this infection are futile.

Terminal disinfection, often by gaseous fumigation, is frequently prescribed by regulation and, by custom, usually expected by the head of the household. The practice of terminal cleansing is gaining ground and the technique of this procedure is outlined in municipal regulations.

Compulsory segregation of tuberculous individuals who, for any reason, become a menace to the public health, does not appear to be a popular legal measure. In 1923, 38 cities in the present group reported such a provision while only 20 of these cities indicated that some effort was made toward its enforcement, 14 cities² giving some data in respect to the number of individuals isolated in this manner. The extreme chronicity of this disease in some instances

² Allentown, 15; Bridgeport, 6 as an average; Duluth, "approximately 550"; Fall River, 2 by court order; Jersey City, 203; Lawrence, 2; Memphis, 3; Milwaukee, 10; New Haven, 1; Newark, "average 5 or 6 per annum"; Paterson, 2; Rochester, "several"; St. Louis, 12; Sioux City, 6.

and the ambulatory capacity of many patients constitute some of the obstacles to compulsory segregation.

Antispitting laws, ordinances, or regulations were reported as in force in all of the 100 large cities with the exception of Memphis, Peoria, and Wilmington. Only 37 cities indicated that some effort was made to enforce this measure of protection, mainly in the larger cities. Crusades have been launched from time to time to discourage the all-too-frequent custom of promiscuous spitting in public places, but as a rule efforts in this direction are desultory or confined merely to warning placards in public conveyances and buildings and elsewhere. The enforcement of this law is sometimes the duty of the police, and an occasional arrest has been reported, but on the whole, it has probably had but little effect in reducing this revolting habit.

Among the special measures directed against further spread of tuberculosis, mention should be made of the increasing efforts to secure a safe milk supply from tuberculin-tested cows. For 1923, 67 cities, giving definite data, reported that 62.6 per cent of the cows producing their milk supply were tuberculin tested, larger percentages being reported for the smaller cities in which relatively more raw milk is sold. The majority of the cities under consideration require that all raw milk offered for sale in any form shall come from cows free from tuberculosis, as shown by the tuberculin test; and as an added safeguard this test is sometimes required even though the milk is subsequently Pasteurized. Laws for the tuberculin testing of cattle are frequently enforced under the jurisdiction of State authorities.

Pasteurization of milk, while not directed solely against the possible spread of tuberculosis through this important article of food, is nevertheless one of the safeguards required by many municipal health authorities. In the 100 large cities in 1923, 90 per cent of all the milk sold was reported as Pasteurized, an average of about 75 per cent in the smaller cities and 97 per cent in the larger cities.

ORGANIZATION AND ADMINISTRATION OF HEALTH DEPARTMENT ACTIVITIES

Among the 62 cities in which the health department reported some antituberculosis work, these activities were organized and administered under a separate bureau or division of tuberculosis in only 20 cities. In 22 other cities, with varying degrees of organization, all tuberculosis work was administered as a function of the division of communicable diseases. In nine cities the health officer assumed general direction of such activities as were undertaken. In eight other cities all control measures were centered in tuberculosis clinics or hospitals maintained by the health department, while in

Louisville the city and county jointly operated a sanatorium. In Baltimore, nursing service for tuberculosis cases was supplied by the bureau of nurses, and a municipal tuberculosis hospital was conducted by the department of charities. In Jacksonville, the division of public-health nursing reported 1,018 visits to tuberculosis cases; cases visiting the health department dispensary were examined by a volunteer physician and a 16-bed county hospital admitted a few city cases.

It is apparent, therefore, that, as far as health department activities are concerned, antituberculosis work was definitely organized in less than 25 per cent of the 100 large cities. In the other cities (33 cities) it was largely incidental to other services or confined to the facilities provided for hospital and clinic care (9 cities).

Separate divisions of tuberculosis.—Only 20 cities,³ out of the 100 large cities, reported the organization of separate bureaus or divisions for the administrative supervision of tuberculosis work carried on by the health department. On reviewing the provisions made for the control of tuberculosis in these 20 cities, it is found that, in some instances, only very limited funds and personnel were available for tuberculosis control and the extent of the work being carried on in some of the distinctly organized divisions of tuberculosis was apparently no greater than the service rendered in some of the cities in which efforts to control this disease were merely a part of the general service program of a division of communicable diseases. In one other city reporting a separate division of tuberculosis (Norfolk) the only record of activity was a contribution of \$2,400 towards the operation of a clinic which was maintained by a private association.

Of the cities reporting more or less fairly well defined and separate divisions of tuberculosis only 4 cities⁴ provided whole-time medical directors or physicians in charge of this important activity. In one other city (Yonkers), the "bureau of tuberculosis" included a dispensary in charge of a whole-time superintendent at a salary of \$1,700 and a hospital division under a part-time physician receiving a salary of \$1,900. Eleven cities in this group provided part-time physicians who were responsible for the work undertaken by the health department. In 4 other cities all tuberculosis activities were carried on under the general direction of the health officer or assistant health officer, all of them part-time officers, while in Buffalo they were placed under the general supervision of the chief of the division of communicable diseases.

³ Group I—Buffalo, Cleveland, Detroit, Los Angeles, New York, Philadelphia, San Francisco; Group II—Cincinnati, Milwaukee, Newark, Seattle; Group III—Duluth, Fall River, Grand Rapids, New Haven, Oakland, St. Paul, Syracuse, Yonkers.

⁴ Detroit, Grand Rapids, Milwaukee, San Francisco.

The salaries paid to the 4 whole-time medical directors of divisions of tuberculosis varied from \$3,300 (Milwaukee) to \$4,500 (Detroit). The 11 part-time physicians in charge received salaries varying from \$700 (New Haven) to \$4,000 (Philadelphia).

One of the obvious conclusions that must be drawn from such an analysis of health department activities in the interest of tuberculosis control is that this disease has not been considered of sufficient importance to require specific administrative attention. Such a conclusion does not seem warranted in view of the known incidence and mortality rates in many of the cities included in the present study, and yet only 4 of the 100 cities reporting for 1923 provided separate divisions and whole-time medical directors who devoted all of their time to the control of tuberculosis.

The 20 cities in the present discussion contain nearly half of the total population represented in the 100 large cities. The provisions made by the official health agencies for the other half of this population are even less adequate, as shown by the following analysis.

Control measures incidental to other organized activities.—In 22 cities reporting for 1923 such tuberculosis work as was undertaken by the health authorities was placed under the general direction of an organized bureau of communicable diseases. In 7 cities in this group the chief of this bureau was a whole-time executive in only four instances. In 9 other cities the general management of this bureau was exercised by 3 whole-time health officers, 4 part-time health officers, and 2 part-time deputy or assistant health officers. In the 6 remaining cities these activities were supervised by a part-time clinic physician in Lowell and New Orleans, a part-time tuberculosis physician in Rochester, while in Richmond a whole-time physician was placed in charge of all antituberculosis work.

In nine other cities, the health departments' contribution to the control of tuberculosis, varying considerably in extent and adequacy, was carried on under the general direction of the health officer incidental to other administrative responsibilities. In all of these cities there was no distinct divisional organization and in four instances the health officer was a part-time official.

In 6 cities, the principal activities of the health department in the control of tuberculosis were centered in clinics; in two other cities the health department maintained a hospital for tuberculosis cases; in Louisville a sanatorium was operated jointly by the city and county authorities. In Baltimore and Jacksonville all antituberculosis work was carried on through the bureau of public health nursing.

While the foregoing analysis of health department activities directed toward the control of tuberculosis gives no direct measure

of the extent or value of these activities, it does however, indicate that public health authorities have, in perhaps a majority of the large cities, made inadequate provisions for the control of this disease. Fortunately, in addition to the facilities provided through the official health agencies, other measures were offered in some of the 60 cities, already considered, by other municipal departments and by various private or voluntary antituberculosis leagues or associations.

ANTITUBERCULOSIS ACTIVITIES IN OTHER MUNICIPAL DEPARTMENTS

Of the 38 cities reporting no health department activities directed toward the control of tuberculosis, in 9 cities some other municipal department operated a sanatorium or provided clinic or dispensary facilities and, in some instances, an active field nursing service. In Boston and Chicago, and, to some extent at least in some of the other cities in this group, those municipal agencies were rendering services that are proper and usual functions of the central health authorities, often without any apparent coordination or relationship.

The Boston sanatorium department provides hospital facilities and maintains a field nursing service for tuberculous cases. In Chicago a similar situation exists, and in St. Louis all tuberculosis hospital and nursing facilities are placed under the jurisdiction of a hospital division which is not administered by the health department. In the other six cities (Birmingham, Fort Worth, Houston, Kansas City, Mo., Peoria and Providence) municipal authorities other than the health department maintain tuberculosis hospitals and, in at least two instances, clinics. The clinics and camp for consumptives at Wort Worth are operated jointly by the city and county authorities.

STATE AND COUNTY PROVISIONS

In addition to the 71 cities already reported as having made some provision for the control of tuberculosis under municipal direction, 15 other cities reported the availability of either State or county hospitals, clinics, or dispensaries, and, in a few instances, field-nursing service. The facilities offered in different cities in this group vary and the present surveys did not, as a rule, contain sufficient data to permit any estimate of the extent of the facilities so provided. Hospital accommodations were provided by county authorities in 6 of these cities, clinics or dispensary service were maintained by State departments in 6 cities, and in at least 2 cities a field service was provided under county supervision.

CITIES SERVED ONLY BY PRIVATE AGENCIES

As far as could be ascertained from the data collected for 1923, State, county, or municipal authorities made no definite provisions for the care of tuberculosis patients in 14 of the 100 large cities, although city patients may have been admitted to State or county hospitals. In these 14 cities, private organizations and visiting nursing associations were engaged more or less actively in anti-tuberculosis work. The character and extent of the services rendered in this group of cities could not be determined satisfactorily from the records available.

RÉSUMÉ OF PROVISIONS MADE BY VARIOUS AGENCIES

The foregoing discussion is intended merely to indicate the variety of agencies engaged in antituberculosis work in each of the 100 large cities. Although a more critical analysis can not be made from the data collected for 1923, it has served, at least, to supply the following brief summary:

In 86 cities a more or less definite program of tuberculosis work was being carried on under the direction of some State, county, or municipal authority. The health department, in 62 cities, reported some activity. In 38 cities there appeared to be no organized effort on the part of the local health authorities directed toward the control of this disease, although, fortunately, something was being done by other governmental agencies. In 9 of these 38 cities hospital facilities were provided under municipal management outside the jurisdiction of the health department, including, in some instances, an active field nursing service and fairly adequate clinic and dispensary facilities. Of the entire group, therefore, 71 cities maintained some municipal service, while a few other cities (reports from Portland and Wilkes-Barre) contributed funds for the care of city patients in sanatoria or clinics operated by State, county, or private agencies.

In 15 cities reporting no municipal activities, State or county authorities maintained either a sanatorium or dispensary service, or both, available to city patients, and in the remaining 14 cities, mainly the smaller cities, local and county antituberculosis associations and local visiting nursing organizations were reported as carrying on some activities.

Such a résumé would be somewhat misleading without further reference to the work carried on by State, county, or private agencies in the 71 cities reporting some municipal activities, and the additional service rendered by private antituberculosis associations in the

15 cities reporting no municipal activities. As far as the available data permit, the extent of the work carried on by these three classes of agencies will be summarized later in this section.

MEDICAL AND OTHER PERSONNEL ENGAGED IN TUBERCULOSIS WORK

A reliable tabulation of all the professional personnel engaged in active tuberculosis work might serve as a fair index of the character and extent of the service rendered. These data for the different agencies reporting for 1923 were frequently incomplete and not always comparable. The number of physicians or nurses employed on a salary basis was frequently supplemented by voluntary workers, and it was practically impossible to give relative values to the services of part-time personnel. It was also impossible frequently to determine whether personnel credited to this activity could be properly considered as rendering specialized service, or whether the service given to tuberculosis cases was merely a part of a general communicable-disease program.

In spite of rather incomplete and sometimes unreliable information, the following facts will serve as a minimum estimate of the personnel who rendered some service in the control of this disease in the 100 large cities during 1923.

Field service.—From all the available data collected for 1923, Table III gives a record of the physicians and nurses engaged in field service for the control of tuberculosis as reported by the various agencies. Hospital and sanatorium personnel have not been included in this table for the reason that these data were so frequently omitted in the schedules. Physicians and nurses serving in tuberculosis clinics and dispensaries have been included whenever specified, as it was difficult and frequently impossible to segregate clinical personnel from others on duty only in the field service. Clinic and dispensary service in some instances is also extended to home visiting either by physicians or nurses or both.

In preparing the data on personnel presented by population groups in Table III, the attempt was made to credit to tuberculosis work every physician or nurse who was reported as rendering any service in this field. As far as could be ascertained, the record of health department personnel given in this table is probably a fairly complete record. The record of personnel engaged in this work under other official agencies, all of which were municipal with the exception of those in three cities in Group IV reporting State activities, is also believed to be fairly complete. The number of physicians, nurses, and others rendering service under various private organizations is, undoubtedly, an understatement, and for that reason rep-

resents a low estimate of the personnel serving with these private agencies.

Physicians.—Grouping together all the physicians reported as engaged in field control activities in any capacity, either whole or part time, Table III gives a total of only 27 whole-time physicians in 97 cities for which information is available. Twelve of these physicians were health department employees, 12 were on duty with other official municipal agencies, while 3 were reported by private organizations. No whole-time physicians were reported by the health departments of the 26 cities in Group IV.

Of the 336 part-time physicians reported for the entire group, slightly over 62 per cent (219) were rendering service of some sort in municipal health departments in the 58 cities included in this tabulation—149 in Group I, 39 in Group II, 19 in Group III, and 12 in Group IV. Thirty-five part-time physicians were reported for other municipal agencies in Group I (Boston, Chicago, St. Louis). Eight part-time physicians included in the above total were reported as serving in State clinics (Allentown, Harrisburg, Wilkes-Barre), doing some follow-up work in the homes. Various private organizations reported a total of 82 part-time physicians rendering some service either in clinics or follow-up care.

The number of physicians engaged in tuberculosis work per unit of population is shown in Table III, the figures representing the average number per 100,000 population for the cities reporting one or more whole or part time physicians. It is obvious that the average number of whole-time physicians engaged in this work is much less than one per 100,000 in all of the groups studied. Including all part-time physicians serving on the staffs of health departments and other official agencies, there were 1.2 physicians per 100,000 on duty in 1923. The ratio for service rendered to private organizations, either paid or voluntary, is probably larger.

It was not possible, except in relatively few instances, to make any distinction between physicians serving only in clinics or dispensaries and those engaged in administrative or other duties. Some undoubtedly rendered more than one type of service.

The salaries paid by health departments for whole and part time physicians varied widely. Whole-time directors or chiefs of divisions of tuberculosis received salaries varying from \$3,300 (Milwaukee) to \$4,500 (Detroit and Grand Rapids). Part-time chiefs of divisions received from \$700 (New Haven) to \$4,000 (Philadelphia). Part-time physicians serving in clinics or for other duties received from \$240 to \$1,740, while gratuitous services were reported by a number of cities.

TABLE III.—*Personnel engaged in the control of tuberculosis (exclusive of hospitals and sanatoria), 100 large cities, as reported for 1923*
 [Averages for personnel per 100,000 employed by the various types of agencies are computed only for cities having specified personnel]

Agency	Num-ber of cities or agencies	Physicians		Nurses		Others	Average personnel per 100,000 population			Remarks	
		Whole time	Part time	Whole time	Part time		Physicians		Nurses		
							Whole time	All	Whole time		All
GROUP I											
Health departments.....	8	5	149	85	334	24	0.04	1.3	0.7	3.4	
Other official agencies.....	3	12	35	185	34	73	.3	1.0	4.1	4.4	
Private organizations.....	14	-----	6	60	-----	19	-----	.1	1.4	-----	
Total Group I (12 cities).....	25	17	190	330	368	116	.1	1.2	1.9	4.0	
GROUP II											
Health departments.....	10	3	39	31	154	12	.1	1.3	.8	4.8	
Private organizations.....	22	-----	22	34	49	73	-----	.5	.9	2.1	
Total Group II (16 cities).....	32	3	61	65	203	85	.1	1.1	1.2	4.8	
GROUP III											
Health departments.....	30	4	19	57	54	7	.2	.9	1.3	2.5	
Other official agencies.....	1	-----	-----	1	9	-----	-----	-----	1.0	10.0	
Private organizations.....	62	3	48	76	211	64	.06	1.1	1.6	6.0	
Total Group III (48 cities).....	93	7	67	134	274	71	.1	1.0	1.9	5.8	
GROUP IV											
Health departments.....	10	-----	12	6	15	-----	-----	1.4	.7	2.4	
Other official agencies.....	4	-----	8	4	6	1	-----	2.5	1.3	3.1	
Private organizations.....	40	-----	6	20	88	11+	-----	.4	1.3	7.1	
Total Group IV (21 cities).....	54	-----	26	30	109	12+	-----	1.4	1.6	7.6	
ALL CITIES											
Health departments.....	58	12	219	179	557	43	.06	1.1	.8	3.4	
Other official agencies.....	8	12	43	190	49	74	.2	1.1	3.9	4.9	
Private organizations.....	138	3	82	190	348	167	.2	.7	1.6	4.6	
Total (97 cities).....	204	27	344	559	954	284	.1	1.2	1.8	4.7	
Do.											
Oklahoma City.											
3 State clinics included.											
Incomplete.											
Do.											

Public health nurses.—After a careful review of all the information collected so far, there were 58 cities, out of the 100 large cities, in which municipal health departments employed one or more public-health nurses either in tuberculosis clinics or in some other phase of antituberculosis activity. The number of nurses on duty only in clinics was not always clearly defined, so that no attempt has been made to classify this personnel. It is probable, however, that the majority of nurses serving in clinics were also engaged in follow-up work in homes, either exclusively for tuberculosis or as a part of a generalized service. This home service was apparently largely instructive in nature although some bedside care was given in some cities so reporting.

Table III includes the record of all the public-health nurses engaged in antituberculosis activities under official direction in the group under consideration. The figures given for private organizations is admittedly incomplete and less reliable. The personnel reported by antituberculosis leagues and societies has been included, but it was frequently impossible to present a satisfactory and reliable summary of the private nursing organizations that rendered some service in this field of activity. Data presented in Table III, therefore, include the personnel reported by 138 private organizations doing some tuberculosis nursing.

In the 58 health departments reporting one or more nurses in 1923, a total of 179 nurses are recorded as giving their full time to tuberculosis work, either in clinics or home visiting, and 557 nurses were reported as giving part-time service in this field. Of the latter group, practically all were full-time employees who devoted part of their time to clinics or follow-up work incidental to other service, either specialized or generalized. The exact division of their time was usually indefinite so that it was not possible to attempt to allocate any portion of it to tuberculosis alone.

Thirty-six cities reported one or more specialized tuberculosis nurses on duty in the health department. In the 22 other cities reporting some activity in the field under health direction, some attention was given to tuberculous cases as a part of a generalized nursing service.

Other municipal agencies (7 cities) engaged in tuberculosis activities reported a total of 190 whole-time and 49 part-time nurses, exclusive of hospitals and other institutional care of the tuberculous sick. This personnel was employed in out-patient service in the municipal tuberculosis departments of Boston and Chicago and under the hospital division in St. Louis, all of them rendering service that is a usual and proper function of the central health authorities. Three State clinics reported a total of 4 whole-time and 6 part-time nurses.

A large number of private organizations were engaged in some form of antituberculosis work, including State, county, and local tuberculosis associations and, in nearly all cities, visiting nursing organizations. Personnel data were recorded for only 75 cities out of 138 different private agencies mentioned in the schedules as rendering some service. There were 190 full-time nurses so reported. There were also 348 other nurses who did some tuberculosis nursing, chiefly as a part of a generalized service provided by private nursing agencies.

Grouping together all the nursing personnel reported as doing some tuberculosis nursing, there were 559 whole-time and 954 part-time nurses so designated in 97 of the 100 large cities.

For 58 health departments there was an average of 3.4 nurses per 100,000 population including all part-time nurses. The ratio for whole-time service was only 0.8. The highest average for all nurses is found in Group II (4.8) and the lowest in Group IV (2.4). Thirty cities in Group III gave an average of 1.3 whole-time nurses per 100,000, a higher ratio than is found in any other group.

The three municipal departments (not health departments) carrying on this work in Boston, Chicago, and St. Louis reported an average of slightly over 4 whole-time nurses per 100,000 engaged in either clinic or field service.

The ratio for all private organizations for which data were collected was 1.6 for whole-time and 4.6 for all tuberculosis nursing. The record here is a direct understatement for the reason that the agencies in the larger cities in Group I were so numerous that it was deemed impracticable to attempt to collect this information.

Other personnel.—In addition to the physicians and nurses reported as engaged in some form of antituberculosis work, a total of 284 other personnel were reported. There were included here secretarial, clerical, and other workers serving with health departments, antituberculosis societies, and private nursing agencies. This total also included special personnel such as nutrition workers and other more or less specialized services, but the distinction was not always clear and no attempt is made to classify this group. The totals given are incomplete, as many of the agencies reporting failed to supply detailed information.

In municipal health departments, in some cities at least, some of the procedures associated with the attempts to control tuberculosis, as in the case of other communicable diseases, are carried out by certain lay personnel. It is the usual practice in a number of cities to assign the duties of placarding, maintenance of quarantine, terminal "fumigation," and even other control measures to sanitary inspectors or to personnel sometimes listed as "quarantine officers."

In cities having no well-defined program for the control of tuberculosis this practice represents the only effort made in the attempt to control the spread of this disease.

Adequacy of personnel.—The present discussion of the personnel available for the control of tuberculosis fails to supply any basis for estimating the number of physicians, nurses, or other workers that are required in order to provide a reasonably adequate control program. The averages given for cities in the four population groups are misleading unless thoughtfully interpreted.

In health departments having organized divisions of tuberculosis, the personnel and expenditures, on a population or per capita basis, vary considerably and it would be difficult and at the same time impracticable to set up any standard or uniform budget and program that could be universally adopted on the basis of the data now at hand. In Boston and Chicago, cities in which the control of tuberculosis is a function of an independent municipal department, the personnel and budget provided for out-patient and hospital facilities probably exceed the provisions made in other cities of the same group.

Of the 33 cities⁵ having a crude death rate from tuberculosis exceeding 100 per 100,000 in 1923, 10 cities made practically no provisions for the control of this disease either by the health department or other municipal agency, and the control measures organized in 17 other cities were, for the most part, obviously inadequate, at least on the basis of average practice in other cities included in the present study.

EXPENDITURES FOR TUBERCULOSIS CONTROL

After a careful check of the expenditure items charged to the health departments of the 100 large cities and utilizing such information as was available during the survey for 1923, there has been included in Table IV all the expenditures that could be credited to the control of tuberculosis in 54 of the 100 large cities. The data for the municipal agencies engaged in this work is probably fairly complete but the totals given for private activities is very incomplete and much less reliable for the reason that it was not deemed practicable to prolong the survey in order to more thoroughly canvass the many organizations that contribute in various ways to the problem of tuberculosis control. Among these private

⁵ Group I, Baltimore, Boston, Buffalo, Los Angeles, Philadelphia, San Francisco; Group II, Cincinnati, Columbus, Denver, Indianapolis, Kansas City, Mo., Louisville, New Orleans, Toledo, Washington, D. C.; Group III, Albany, Atlanta, Birmingham, Cambridge, Fall River, Houston, Jacksonville, Kansas City, Kans., Memphis, Nashville, Norfolk, Richmond, St. Paul, San Antonio; Group IV, El Paso, Knoxville, San Diego, Savannah.

agencies cost-accounting methods vary and in many instances, especially for the private nursing organizations, it is difficult, if not impossible, to obtain reliable data concerning the cost of tuberculosis work, except after prolonged research.

For the 46 cities excluded from Table IV, local authorities undoubtedly contributed to the care of city patients in county and other hospitals, but no records of these allotments were available.

TABLE IV.—*Expenditures chargeable to the control of tuberculosis, including clinics, follow-up, and hospital care (incomplete records for "other official agencies," State, county, and private expenditures) as reported for the 100 large cities, 1923. (Average per capita expenditures are computed only for those cities for which the necessary data were available)*

Agency	Expenditures for clinics and (A) follow-up service				Expenditures for hospital (B) and sanatorium care			Average per capita for all municipal expenditures reported	
	Number of cities (c) or agencies (a)	Total reported expenditures	Average per capita	Per cent of total (city) allotment for health service ¹	Number of cities	Total reported expenditures	Average per capita	Number of cities	Per capita
GROUP I									
Health Departments.....	8c	551,756	<i>Cents</i> 4.5	7.7	4	946,730	<i>Cents</i> 11.6	8	<i>Cents</i> 27.4
Other city agencies.....	3c	816,690	18.3	-----	4	1,565,020	31.3		
Private organizations.....	4a	220,536	5.7	-----	-----	-----	-----		
Total Group I.....	11c	1,488,982	8.6	-----	8	2,511,750	19.1	-----	-----
GROUP II									
Health departments.....	10c	116,658	3.1	5.2	1	171,112	54.2	4	22.5
Other city agencies.....	-----	-----	-----	-----	3	167,266	15.4		
Private organizations.....	11a	223,814	5.9	-----	-----	-----	-----		
Total Group II.....	14c	340,472	6.8	-----	4	338,378	24.2	-----	-----
GROUP III									
Health departments.....	28c	132,333	3.1	4.7	9	335,229	27.9	30	18.5
Other city agencies.....	3c	13,470	3.3	-----	13	400,310	18.5		
Private organizations.....	31a	293,091	6.2	-----	-----	-----	-----		
Total Group III.....	43c	438,914	6.8	-----	22	735,540	21.8	-----	-----
GROUP IV									
Health departments.....	8c	19,174	2.7	4.2	1	49,543	50.8	10	20.7
Other city agencies ²	4c	7,820	2.4	-----	2	57,962	36.7		
Private organizations.....	11a	57,568	5.5	-----	-----	-----	-----		
Total Group IV.....	18c	84,562	5.4	-----	3	107,505	42.1	-----	-----
ALL CITIES									
Health departments.....	54c	809,921	3.8	6.5	15	1,502,614	15.4	52	24.9
Other city agencies.....	10c	837,980	16.1	-----	22	2,190,558	26.1		
Private organizations.....	57a	795,019	5.9	-----	-----	-----	-----		
Total all cities.....	97c	2,452,920	8.3	-----	37	3,693,172	20.4	-----	-----

¹ Based upon data given in Chapter I

² Includes 3 State clinics.

Table IV includes all the municipal expenditures for tuberculosis clinics and field services that could be found in the financial statements of the 100 cities in this group. Seven cities expended varying amounts for tuberculosis activities either through departments other than the health department (Boston, Chicago, Oklahoma City, St. Louis) or by special allotments to private agencies (Troy, Wilmington, Worcester). For 57 private antituberculosis societies and nursing agencies it was possible to obtain the actual or estimated expenditures chargeable to tuberculosis work. In preparing estimates of the probable expenditures for several of the agencies included in Table IV it was necessary to prorate reported expenditures on the basis of the number of nursing visits credited to tuberculosis or to include only the well-defined items of expense such as salaries.

No attempt was made in preparing Table IV to separate the cost of clinics or dispensary care from field nursing and other home service for the reason that this distinction was made possible for only a few cities. Personnel, especially the nursing staff, engaged in clinics or dispensaries usually reported some follow-up visiting in the homes and it would be practically impossible to even prorate the cost of each kind of service because of the rather universal absence of reliable cost-accounting methods.

Out of the entire group, only 54 health departments reported any expenditures that could be charged to antituberculosis activities in clinics or field service. In only 36 cities did the health department segregate its expenditures sufficiently to specify the amount expended in tuberculosis control, including the 20 cities with more or less well-organized administrative divisions of tuberculosis. The total expenditures charged to the health departments in these 54 cities was \$809,931, or an average per capita cost of 3.8 cents. Incidental expenditures that would be properly chargeable to some form of tuberculosis field activity in a few other cities would probably not materially influence this per capita item, except possibly to reduce it.

The average per capita expenditure for health department tuberculosis clinics and field service in the 54 cities reported, varied from 0.1 to 11.2 cents, only 20 cities exceeding the general average (3.8) for the entire group.

For the 3 cities in Group I in which the tuberculosis control activities were exercised by a separate administrative department, the average per capita expenditure for clinics and follow-up was 18.3 cents. Three cities in Group III reported a similar expenditure of 3.3 per capita, while the 4 cities in Group IV included in Table IV reported a per capita expenditure of only 2.4 cents. The general

average for other municipal agencies (10 cities) is 16.1 cents per capita, approximately five times higher than the record from the 54 health departments.

On a basis of the total expenditure for all essential health services, as shown in Table I, Chapter I, charged to the health department in the 54 cities included in Table IV, an average of 6.5 per cent of this total expenditure was allotted to antituberculosis activities, exclusive of hospital costs. This percentage varied from 7.7 in the larger cities to 4.2 for the cities in Group IV, individual cities showing variations from 0.2 to 12.8 per cent.

For the 57 private organizations reporting on this item of expenditures, or for which a reasonably reliable estimate was included in the present tabulation, the average per capita expenditure amounted to 5.9 cents, indicating that these private agencies made a greater financial contribution to antituberculosis activities than was reported for the average health department.

The Boston sanatorium department reported an expenditure of \$93,631.45, or a per capita of 12.2 cents for clinic and follow-up field service for 1923 in addition to hospital maintenance. This service represents the tuberculosis control activities usually undertaken by the municipal health department. A similar situation exists in Chicago, the municipal tuberculosis department reporting an expenditure of \$691,082.04 for a per capita of 23.9 cents, for the operation of clinics and home visiting. In St. Louis, all municipal tuberculosis activities are centered in a separate division of the hospital department, the health department carrying on no antituberculosis work. This division reported the expenditure of \$31,976.45, or 4.0 cents per capita, fairly comparable to the average for other cities in the same group.

When it is realized that the expenditures of private organizations, as given in Table IV, probably do not represent over half of the actual cost of the antituberculosis service rendered by these agencies, it is at once apparent that municipal health departments have subscribed to considerably less than one-third of the financial cost of all the tuberculosis control activities carried on in this group of cities. Boston, Chicago, and St. Louis alone expended more during 1923 (\$816,690) than the combined expenditure of the health departments in the 54 other cities.

Health departments in the larger cities average relatively larger per capita expenditures than do the cities following in each smaller population group. In all of the groups in the present series, voluntary organizations have undoubtedly shouldered a large burden of the expense of maintaining the service that has been provided.

For the operation and maintenance of tuberculosis hospitals and for the care of city patients in other hospitals, the health departments of 15 cities reported a total expenditure of \$1,502,614 or an average per capita of 15.4 cents. This per capita expenditure varied from approximately 3 cents, as reported for New York City, to 54.2 cents for Seattle and Lynn.

In four cities in Group I (Boston, Chicago, Detroit, St. Louis) in which the hospital care of tuberculosis patients was provided by a separate municipal department a total of \$1,565,020 was expended for the maintenance of tuberculosis hospitals or sanatoria, giving an average per capita expenditure of 31.3 cents. Three cities in Group II (Kansas City, Mo.; Louisville, care of patients in county hospital; Seattle; Washington, D. C.) reported a total expenditure of \$167,266, or 15.4 cents per capita. In Group III 13 cities⁶ reported a total expenditure of \$400,310 chiefly for the care of city patients in county hospitals, with an average per capita of 18.5 cents. In Group IV Peoria expended \$56,424.18 for the maintenance of a tuberculosis hospital, maintained by a special commission, with a per capita rate of 70.7 cents. In St. Joseph the estimated cost of maintenance of a bungalow for tuberculous patients operated in connection with the isolation hospital was \$1,538. The average per capita expenditures for hospital care in 22 cities, charged to "other city agencies," was 26.1 cents. For the 37 cities included in Table IV the average was 20.4 cents per capita.

Grouping together the total municipal expenditures for the control of tuberculosis including hospital care, 52 cities reported a total expenditure of \$5,354,119, with an average per capita amounting to 24.9 cents. Similar data for the entire group of 100 large cities are not available. It is probable, however, that the total municipal expenditures for the cities excluded from Table IV would fall far short of those presented in this table, the reports for many of these cities indicating no city appropriations for the control of tuberculosis or for the care of patients in hospitals.

The data presented in the present discussion does not by any means represent the total financial burden imposed upon the cities under consideration. Large expenditures by private agencies are not recorded, and no record is available to offer any estimate of the financial costs and losses sustained by those who have contracted tuberculosis. The figures given in Table IV represent merely the average municipal outlay to be charged against this disease.

⁶ Atlanta, Birmingham, Dallas, Fall River, Memphis, New Bedford, Oklahoma City, Providence, Richmond, St. Paul, San Antonio, Trenton, Utica.

CASE REPORTING

Tuberculosis is listed among the diseases required to be reported to the health department in all but one (Denver) of the 100 large cities, and yet, for various reasons, there appears to have been a reluctance on the part of the practicing physician to report all the cases of this disease coming to his attention, notwithstanding the fact that compulsory notification laws relieve the physician of any burden of responsibility in respect to the betrayal of professional secrets. There is, perhaps, a diminishing tendency to conceal the existence of tuberculosis. Difficulties in diagnosis of early cases, failure to resort to laboratory verification, neglect in obtaining medical care, and the peculiar psychology and dread frequently attached to the disease, are some of the factors that have contributed to the general incompleteness in the reporting of tuberculosis.

With compulsory notification laws, provision should be made for their effective enforcement. There appears to be greater hesitancy on the part of administrative health officers to enforce this legal requirement in the case of tuberculosis than exists in connection with other communicable diseases with the possible exception of venereal infections.

Antituberculosis campaigns have served to encourage the general public to recognize the need for early and accurate diagnosis in respiratory disorders in order that prompt treatment may prevent unnecessary advancement of the infection and more assuredly give promise of recovery.

Every case of tuberculosis becomes a focus for further spread of the infection and because of the ambulatory capacity of many early cases, the general public is entitled to a maximum of protection which depends mainly upon early diagnosis and the institution of adequate and effective means of preventing or minimizing the possible spread of the disease as far as possible. The first step, then, in the control of tuberculosis is the prompt reporting of all cases of the disease to the central health authorities.

There has evidently been some increase in the number of cities requiring the registration of tuberculosis cases since 1920. In the report covering the survey of 83 large cities made in that year, 69, or approximately 80 per cent, of the cities were credited with such laws whereas in 1923 all but one of the same group of cities reported compulsory notification of tuberculosis under State or local laws.

There is but little evidence of any general improvement, however, in the extent to which the compulsory notification of tuberculosis has been enforced. The slight increase in the number of cities show-

ing, on an average, a higher ratio of reported cases to deaths in 1923, as compared to 1920, may be due to declining death rates or more accurate statistical morbidity and mortality records.

In discussing tuberculosis in the report covering the survey of 1920, Winslow and Baker concluded that "four or five cases per annual death would be a reasonable standard" for satisfactory notification of cases of tuberculosis. Reference was also made by these authors to the ratio of nine cases for each annual death obtained by Armstrong in Framingham, Mass., under rather effective administrative control.

In the latest revision of the "Appraisal Form for City Health Work," adopted by the committee on administrative practice of the American Public Health Association, maximum credit is given for the reporting of "two new cases of all forms reported last year per death last year," this ratio having been 5 to 1 in previous schedules.

TABLE V.—*Number of cases and deaths reported as tuberculosis (all forms), ratio of cases to deaths, 95 cities, 1923*

Population Groups	Number of cities	Total number of cases reported	Total number of deaths (crude)	Number of cases reported per each death
I.....	12	41, 271	17, 502	2. 36
II.....	14	10, 587	4, 950	2. 14
III.....	49	10, 667	6, 591	1. 62
IV.....	20	2, 488	1, 793	1. 39
All cities.....	95	65, 013	30, 836	2. 11

In the survey data for 1923 it is presumed that the figures given for the number of cases of tuberculosis reported for that year refer to "new cases," although this condition is not specified. On the basis of two *new* cases per death now adopted by the committee of the American Public Health Association, the general average for the 95 cities in 1923 is 2.1 cases for each death recorded in that year. This average ratio for the different groups varies from 2.36 in Group I to 1.39 in Group IV, with a corresponding decrease for the two intermediate groups. The number of cases and deaths reported for each population group is also shown in Table V.

By referring to Figure 3, however, it will be found that only 40 of the 95 cities for which this data was collected reported two or more new cases per death in 1923. Of this number 10 cities⁷ reported 3 or more cases per death, while 1 city reported 4.3 cases

⁷ Bayonne, Duluth, Flint, Minneapolis, Newark, Rochester, Schenectady, Seattle, Syracuse, Yonkers.

(Chicago). Thirty-three cities reported a ratio of cases to deaths of less than 1.5, 19 cities being less than 1 case and 4 less than 0.5.

INVESTIGATION AND CONTROL MEASURES

In the investigation and follow-up activities that are primarily instituted to prevent the spread of infection from known sources the opportunity to search out unsuspected and unreported cases of tuberculosis constitutes one of the most profitable features of this program. In other words, case finding becomes one of the most essential objectives in the campaign against this disease. With an increasing cooperation on the part of those afflicted with tubercu-

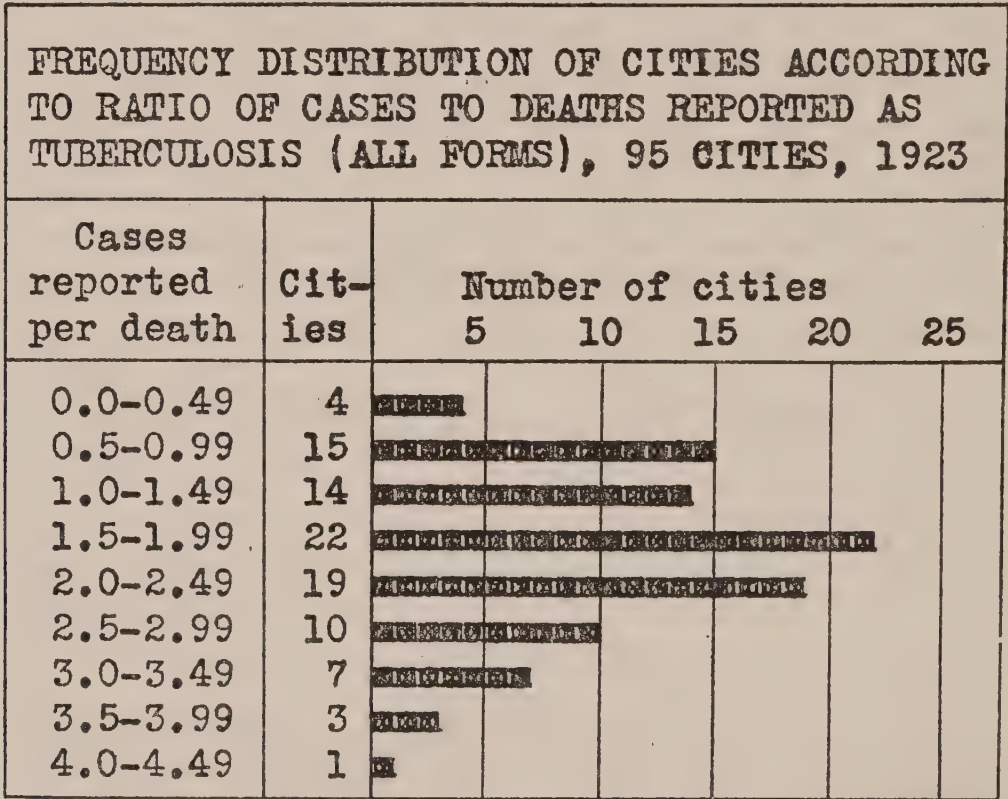


FIG. 3

losis, the control of known cases has become correspondingly less difficult and more successful. Home service offers an opportunity to investigate contacts and to encourage suspects to secure competent physical examinations and, when necessary, the benefits of early treatment.

In addition to the cases reported to the health department there are other possible sources of information, such as positive laboratory findings and the records of hospitals, clinics, and dispensaries. The examinations conducted in the work of school health supervision frequently add to the list of known or suspected cases. Private agencies engaged in nursing or social field service should be encouraged to report all suspicious cases to the central health authorities.

Visits to reported cases.—Upon the receipt of a report of a case of tuberculosis by the health department, a physician or a public health nurse usually visits the case for the purpose of verifying the diagnosis, instructing the patient and his family or attendants in respect to the essential measures to be taken in preventing further spread of this disease, advising or assisting the household in the provisions necessary for the comfort and care of the patient, and encouraging or arranging hospital treatment if necessary.

According to reports received for 1923, in 15 cities a physician from the health department visited reported cases of tuberculosis. In 58 cities health department public health nurses visited these cases. In 3 cities (Boston, Chicago, St. Louis) municipal nurses (not health department) carried on similar activities. In 7 other cities, through arrangements with private nursing organizations, nursing visits were made to cases reported to the health department. Ten cities reported that cases of this disease were visited by lay inspectors, while 10 other cities replied that no visits were made. (Information not available for 15 cities.) In at least 75 of the 100 cities, therefore, some provision was made by the responsible municipal authorities for some follow-up of reported cases, although in individual cities the personnel available for effective follow-up was manifestly inadequate.

The service rendered by voluntary agencies in the follow up and care of tuberculosis cases is an important one in many cities, but no adequate measure of this service could be obtained from the data collected nor was it possible to secure any satisfactory or detailed estimate of the activities of State or county authorities.

Verification of diagnosis.—For 41 cities, the reports received from the health departments indicated that dependence was placed entirely upon laboratory findings for the verification of diagnoses of tuberculosis. Thirty cities reported that diagnosis was verified by both clinic and laboratory findings and 3 cities relied entirely upon clinical evidence. Diagnosis was reported as not verified by 7 cities (no record for 11 cities).

Case records, spot maps, and charts.—In 55 cities, the health department reported that case cards were used for recording data concerning reported cases of tuberculosis. Samples of these case records collected during the survey show many variations in form and completeness of essential data.

Spot maps were reported as in use in 30 cities and the use of various forms of chronological charts was reported by 23 cities. Only 64 of the 100 cities utilized one or more of these rather essential means of carrying on profitable epidemiologic study. Twenty-nine

cities reported that neither case cards, spot maps, nor charts were used (no data for 7 cities).

METHOD OF CONTROL

Success in attempts to control the spread of tuberculosis depends upon early diagnosis, prompt and effective treatment, adequate hygienic management of ambulatory patients, and other measures contributing to the arrest or cure of known cases. In the endeavor to prevent or control the spread of infection, placarding, isolation, concurrent and terminal disinfection, and compulsory hospitalization are, in a measure, coercive methods intended as a warning to the public and as necessary restraints over cases that are considered particularly dangerous sources of infection. Clinics and dispensaries have been provided for diagnosis and treatment and hospital facilities have been made available for advanced cases.

The following summary is presented merely as a means of grouping together the more important measures and facilities that have been utilized in tuberculosis prevention, control, and treatment. As far as the available data permit, the practice and experiences of the cities studied will be reviewed without undertaking to determine relative values or the importance of individual items.

Some of the more important measures and facilities utilized for the control of tuberculosis are:

Reporting of cases to the health department.

Placarding.

Isolation, absolute or modified.

Disinfection, concurrent and terminal.

Follow-up visits, medical and nursing.

Case-finding.

Bedside care.

Clinics and dispensaries.

Preventoria, sanatoria, and hospitals.

Summer camps.

Open-air schools, nutrition clinics, etc.

Placarding.—Health departments in 12 cities reported that cases of tuberculosis were placarded—Allentown, Bridgeport, Chicago, Dallas, Duluth, Flint, Grand Rapids, Louisville, Philadelphia (on demand), St. Joseph, Salt Lake City, Worcester. Cases of this disease were not placarded in 65 cities (no information for 23 cities). None of the reports indicated how thoroughly this practice was carried out.

Isolation.—As far as could be determined, none of the cities studied enforced absolute isolation for the control of tuberculosis, except possibly in occasional incorrigible cases. Forty cities prescribed some modified form of isolation and 40 other cities reported

no attempt to institute quarantine restrictions (no information for 20 cities). Compulsory isolation in tuberculosis, as in other communicable diseases, would undoubtedly influence secondary infections, but effective restraint is difficult to enforce, usually because of inadequate personnel. Through the efforts of visiting nurses, some progress has unquestionably been made in this direction.

Disinfection.—Seventy cities reported that some effort was made to encourage or enforce concurrent disinfection of sputum and other discharges from tuberculosis patients. In 50 cities terminal disinfection by cleansing methods was customary after death, recovery, or change of residence. Thirty-one cities continued the practice of terminal disinfection by the use of gaseous fumigation, while 10 cities reported that none of these procedures were required (no information for 5 cities).

The value of effective concurrent disinfection can not be doubted. The visiting nurse, by instruction and demonstration, and the anti-tuberculosis campaigns, have encouraged better hygiene of the sick room and more satisfactory methods in the disposal of infectious material.

Follow-up visits.—In the control of tuberculosis, home visits by public-health and visiting nurses bring about invaluable contacts between the municipal health service and the cases reported to the central authorities. In 15 cities some of the cases reported were visited by physicians on duty with the health department. The exact rôle played by these physicians, aside from the verifications of diagnosis and the desire to encourage early or satisfactory treatment, and to determine the need for compulsory segregation, was often poorly defined. For both offensive and defensive tactics, health departments have utilized services of public-health nurses, and in many cities this practice has constituted the chief or only mode of attack.

Bedside care.—The extent to which actual bedside care was furnished in emergencies or as a routine under some special plan, such as hourly service, could not be ascertained from data compiled from the 1923 surveys. Some bedside nursing care was provided in a number of cities, but apparently it was intended largely in the nature of a demonstration or incidental to a program of instructive visits designed to encourage effective hygienic management of the cases under supervision.

As in all other diseases subject to health department supervision there appears to be some division of opinion as to whether or not any bedside care should be given by municipal public health nurses. There is, however, a growing tendency to regard the care of disease as one of the responsibilities of the central health authorities. In tuberculosis, as much and perhaps more than in many of the other

communicable diseases, bedside care offers excellent opportunity for introducing important hygienic and preventive measures.

Agencies engaged in tuberculosis follow-up and aftercare.—Reference has already been made to the number of cities in which reported cases of tuberculosis are visited by either a physician or nurse attached to the health department. It seems apparent, however, that active follow-up work was not provided in all of the 75 cities credited with case visiting.

The importance of adequate follow-up of patients suffering with this disease also has been emphasized although it is not possible from the data now available to measure or compare the extent of this service as provided by either the municipal or private nursing organizations. As far as could be determined follow-up service of some sort was available in at least 58 cities through health department nurses and in 4 other cities (Boston, Chicago, St. Louis, Peoria) tuberculosis follow-up and aftercare were provided through special municipal agencies.

In 17 cities, either State or county authorities reported some follow-up and aftercare and there is a record of 64 private agencies performing similar services. In order to present even a general summary of the character and amount of service rendered by these agencies a much more detailed survey than any undertaken so far will be necessary.

Out of 96 cities credited with some tuberculosis follow-up and aftercare by various agencies, the municipal authorities in 1923 were apparently more or less active in only about 65 per cent of the cities giving this information. In the 96 cities there is a record of 141 different agencies engaged in this work and, even in the absence of satisfactory means of comparing the extent or value of the services rendered by different agencies, it is very apparent that health departments in many of the large cities, either through discouragement, inadequate personnel, or failure to recognize the importance of an effective follow-up service, have failed to discharge their responsibility in respect to this disease.

Forty-six cities reported some effort directed toward the vocational rehabilitation of arrested cases although the extent and character of these efforts could not be definitely determined.

TUBERCULOSIS NURSING SERVICE

According to the data presented in Chapter XII, 13.9 per cent of all the home visits reported by health department nurses was credited to tuberculosis. An additional but indeterminate percentage of the visits charged to communicable diseases (16.9 per cent) and to generalized nursing services (5 per cent) should also be credited to tuberculosis.

In 30 cities for which fairly complete data were obtained, a total of 269,499 tuberculosis nursing visits were reported by 153 nurses, or an average of 1,766 visits per nurse, individual records varying from 915 to 3,150 visits. With the exception of generalized nursing (2,595 visits per nurse) and communicable disease control (1,952 visits per nurse), the average number of visits per nurse was higher than for any other nursing activity.

Specialized nursing.—Analysis of all the data collected during the survey for 1923 does not justify any conclusion as to the relative values of specialized and generalized nursing in efforts to prevent or control tuberculosis. As far as could be determined only 37 city health departments employed specialized nurses who gave their whole time to tuberculosis. This specialized group comprised only 9 per cent of the total nursing personnel on duty. In Detroit, 13.6 per cent of the health department nursing staff was assigned exclusively to specialized tuberculosis work.

In other cities (records for 33 cities) tuberculosis nursing was incidental to other nursing activities and, on account of the lack of uniform record keeping or the failure to classify nursing visits, it was difficult and usually impossible to obtain even an approximate estimate of the number of visits chargeable to this disease.

There was approximately an equal number of cities providing specialized and generalized tuberculosis nursing under the supervision of municipal authorities. Private agencies apparently provided both kinds of service, although there appeared to be a tendency to include tuberculosis nursing as a part of a generalized service.

TUBERCULOSIS CLINICS AND DISPENSARIES

For the diagnosis and treatment of tuberculosis one or more clinics or dispensaries were available in all of the 100 large cities in 1923. In the present discussion data concerning clinics include dispensaries as there was apparently no particular difference in the service rendered as far as could be determined.

In the reports from the 100 cities, reference was made to a total of 292 clinics, including those for which no data was collected. Irrespective of the relative size of the city, the capacity of individual clinics, as measured by the number of patients or visits reported for 1923, varied between extremely wide limits. Some of the clinics reported as such undoubtedly represented segregated reports of general medical clinics in which tuberculosis cases were received. Data were collected from only approximately one-half of all the clinics listed in the survey schedules.

Out of 150 clinics for which some data were secured, the health department maintained clinics in only 43 cities. In 18 cities, clinics

were operated by municipal agencies other than the health department, in 17 cities by State or county authorities, in 1 city by the United States Veterans' Bureau, and in 71 cities, including some already listed, by private agencies.

The 18 cities in which tuberculosis clinics were maintained by some municipal agency other than the health department include Boston and Chicago, each having special tuberculosis sanatorium departments; St. Louis, with a separate hospital division charged with tuberculosis control; and 15 other cities in which these clinics are operated in conjunction with city hospitals (Buffalo, Fall River, Jersey City, Kansas City, Kans., Knoxville, Memphis, Providence), a city dispensary (Bridgeport), hospitals maintained jointly by city and county authorities (Fort Worth, Louisville, San Antonio), municipal sanatoria (Houston, Memphis, Peoria), and one city (Oklahoma City) in which a clinic is conducted under a public health nursing bureau but financed for the most part from municipal funds.

Clinic personnel.—The average number of physicians, nurses, or other personnel attached to tuberculosis clinics can not be definitely determined from the information collected. Many of the physicians credited to the clinics gave only part of their time to this work either in salaried positions or through voluntary services. Even in health-department clinics it was not possible to arrive at any reliable estimate of the average number of physicians serving either whole or part time in the clinics. In an incomplete tabulation there was an average of approximately one physician per 100,000 population serving in some capacity in tuberculosis clinics, less than 8 per cent reported as serving full time.

It is even more difficult to segregate, from the available data, the average number of nurses engaged in clinic activities. Many of the nurses credited to the clinics also carried on follow-up work in the homes. Clinic reports usually are indefinite as to the distribution of the nurses' time so that only a rough estimate of the average number per clinic or per 100,000 population can be offered. This average was 3.7 per 100,000 population including all nurses, only about one-third of whom were probably engaged wholly in tuberculosis activities.

Cost of clinic service.—The approximate cost of operation of tuberculosis clinics could be segregated for only 15 cities. Budgets and cost-accounting methods are not usually in sufficient detail to permit a fair estimate of clinic costs. For the 15 cities for which it was possible to determine reasonably reliable data, the average cost per patient was \$4.29 and the average cost per clinic visit was \$1.71, slightly lower than the average reported for 1920 (\$4.53 and

\$1.81 for 14 and 17 cities, respectively). It was not possible to determine the relative cost of clinic maintenance as supported by different agencies, although in a few scattered cities operation under municipal auspices appeared to be less per patient and visit than under other management.

Services rendered.—The average number of clinic hours or sessions per week varied from 1 to 10 or more, irrespective of the type of agency concerned in clinic management. Clinics reporting low attendance were apparently available more often than they were utilized. A much more detailed study of clinic activities would be necessary in order to continue such an analysis. Sufficient material was collected, however, to determine the average number of clinic visits reported by 53 cities.

Reports giving the number of patients received at clinics frequently fail to clearly specify whether the figures used represent all patients admitted or only new patients. Comparative analyses or averages for groups of cities would be misleading unless the data used are critically interpreted.

Attendance at clinics.—Table VI gives the total number of visits to tuberculosis clinics reported by 54 cities for 1923, arranged by population groups, including only those cities for which comparable and apparently reliable data are available.

TABLE VI.—*Attendance at tuberculosis clinics; average number of clinic visits per case and per death reported, and per 100,000 population, arranged by population groups, 54 cities, 1923*

Population group	Number of cities	Total number of clinic visits reported	Total number of cases of tuberculosis (all forms) reported	Total number of deaths from tuberculosis (all forms) reported	Average number of clinic visits		
					Per case reported	Per death reported	Per 100,000 population
I.....	7	283,070	21,087	7,065	13.4	40.1	3,987
II.....	12	64,161	8,717	4,425	7.4	14.5	1,485
III.....	22	38,248	5,457	2,999	7.0	12.7	1,095
IV.....	13	12,777	1,810	1,373	6.9	9.3	1,135
All cities.....	54	398,256	37,171	15,862	10.7	25.1	2,336

The average number of clinic visits per annum per 100,000 population for the 54 cities is 2,336. The average for the 7 large cities in Group I is conspicuously higher than that for any of the other groups, due to the extremely high ratio reported by Chicago (6,980) and Los Angeles (6,604). Omitting these two cities, the Group I average is only 1,015. The high average for this group and for the 54 cities (2,336) is dependent upon the rather gratifying activities of the clinics in some of the larger cities.

Of the 54 cities, 8 reported an annual attendance of over 2,000 visits; 19 cities between 1,000 and 2,000 visits; 27 cities less than 1,000 visits per 100,000 population. Thirteen cities included in the table reported less than 500 visits. The general average for the 54 cities (1923) is slightly higher than the average given for 56 cities in the survey report for 1920 (2,228). For this same period cities having a population of 500,000 or over show an increase from 2,734 to 3,987 visits, while the smaller group of cities show an apparent decrease.

The average number of clinic visits per patient per annum for 42 cities giving this information was 2.6, compared to an average of 2.8 for 1920, with no significant variation in the general averages reported by cities in the different size groups, figures for individual cities varying from approximately 2 to 10 visits per patient. The frequency of visits by new patients as compared with old patients could not be determined from the data reported, clinics giving the number of new patients failing to classify total visits.

In the attempt to compare clinic attendance with some factor as a measurement of the extent to which tuberculosis clinics were utilized, Table VI gives, by groups, the total number of cases and deaths reported as tuberculosis (all forms) for 1923. The average number of clinic visits per case reported for the 54 cities was 10.7 and per death reported 25.1, this difference corresponding to the average ratio of cases to deaths as shown in Table V.

Thirty-five cities reported less than 10 clinic visits per case reported, while 18 cities reported from 10 to 36.4. A high ratio of this character would seem to indicate that the clinics were either attracting a fairly satisfactory percentage of the cases reported during the year or at least succeeding in holding the patients needing this service. Either incomplete reporting or high clinic attendance, or both, would obviously yield high ratios, so that the average given in Table VI can not be accepted as indicating directly either condition.

In the revised appraisal form for city health work developed by the committee on administrative practice of the American Public Health Association, 30 clinic visits for each reported death from tuberculosis was adopted as the ratio receiving a perfect score, and three visits per patient registered at the clinics was also given the highest rating allowed for that item. According to the data tabulated in Table VI, 6 cities reported more than 30 visits per death reported, indicating that the standard proposed in the appraisal form has been attained by at least 11 per cent of these 54 cities. The general average of 2.6 clinic visits per patient per annum reported by 42 cities would seem to indicate that these cities have been even more successful in reaching this appraisal standard.

PROVISIONS FOR HOSPITAL AND SANATORIUM TREATMENT

Facilities, more or less adequate, were available in all of the 100 cities for the hospitalization or sanatorium care of tuberculosis patients. In 55 cities, hospitals or sanatoria were maintained by municipal authorities. Forty-four cities reported that county institutions were available or utilized by city patients, and in 53 cities State sanatoria made similar provisions. Private hospitals, maintained by antituberculosis societies and other private agencies, were available in 36 cities.

In 16^s of the 55 cities having institutional facilities for the care of tuberculosis cases under municipal operation the health department maintained sanatoria or provided special beds in contagious-disease hospitals, or, in a few instances, separate wards for tuberculosis patients.

Number of beds available.—Although some facilities were reported as available in all of the 100 cities, it was impossible or impracticable at the time of the survey to secure accurate data as to the actual number of hospital beds available for city patients, except for those institutions operated under municipal management. Records for State, county, and private hospitals were frequently inaccessible. Estimates were secured in some instances and where the number of beds in nonmunicipal institutions were reported information concerning the number reserved or used by city patients was often lacking. Much of the data secured was not always comparable, so that attempted tabulations would probably be misleading or at least fail to represent existing facilities for hospital care.

Bringing together such data as appeared to indicate reliable records, there was a general average of approximately 60 beds per 100,000 population, about 35 per cent of the cities included in this estimate reporting a higher average. The number of beds per city, either municipally controlled or available through other agencies, showed extreme variations, the larger cities in Group I reporting from 30 to 945 beds, with an average of 422 per city for municipal institutions and approximately 750 beds per city for all beds reported. From incomplete records the averages for the three groups of smaller cities was disproportionately low.

On the basis of the total number of beds reported as presumably available for city cases, only about one-third of the cities reporting had at least one bed for each annual death from tuberculosis, this percentage being considerably reduced if based upon the number of

^s Detroit, New York, Pittsburgh, San Francisco, in Group I; Seattle, in Group II; Bridgeport (in contagious-disease hospital), Cambridge, Grand Rapids, Kansas City, Mo. (tuberculosis ward), Lowell, Lynn, Paterson (contagious-disease hospital), Springfield, Worcester, Yonkers, in Group III; Lawrence, in Group IV.

beds reported as definitely available. Although it is apparent that many of the large cities did not have available, in 1923, the usually proposed standard of one bed for each annual death reported as tuberculosis, there appears to have been a slight increase in the general average from 50 beds per 100 deaths in 1920 to approximately 58 beds in 1923. This increase may have been due in part to the general decline in the death rate from this disease.

Admission rate to hospitals.—The percentage of tuberculosis cases cared for in hospitals or sanatoria during 1923, according to estimates reported by about half of the cities under consideration, showed extreme variations, 5 cities less than 5 per cent; 2 cities from 5 to 10 per cent; 15 cities from 10 to 25 per cent; 11 cities from 35 to 50 per cent and 14 cities over 50 per cent. In these estimates no general distinction was made concerning the stage of the disease in those hospitalized.

The total number of admissions of city cases to all institutions could not always be definitely determined for the nonmunicipal hospitals and sanatoria, the records failing to segregate city patients in many instances. A total of slightly over 20,000 admissions, with an indefinite share of approximately 7,000 patients admitted to State, county, or private institutions, were reported by 77 cities. The average number of definitely recorded admissions per city in this group varied from 1,089 for cities in Group I to 74 per city in Group IV with a possible increase of about 25 per cent in the first and third groups and nearly 125 per cent in the second group on the basis of additional beds available in State, county, or private institutions.

Reports from 63 cities included records of both the number of beds and the number of admissions. For this entire group there was a possible general average of slightly over 1.8 patients per bed per annum or an average length of stay per patient of 6.8 months, showing a small increase over the average for 42 cities (6.2) reported for 1920. The average length of stay in hospitals or sanatoria for Group I was 5.6 months and progressively longer in each succeeding population group, being apparently about twice as long on an average in Group IV.

The general average admission rate to hospitals and sanatoria in 77 cities was approximately 90 per 100,000 on the basis of rather definite records for city patients. Including other possible admissions this average would probably be increased as much as 50 per cent. In a similar group of cities giving the required data there was a general average of approximately 77 admissions per 100 annual deaths from tuberculosis.

Cost of hospital treatment.—The cost of hospital service under municipal management, as reported by 37 cities, has already been presented. The average per capita expenditures for the 37 cities was 20.4 cents.

The average cost per patient per day for institutional treatment of tuberculosis, as reported by 63 hospitals and sanatoria utilized by city patients in 51 cities, was \$2.58. The lowest per diem rate (\$1) was reported by Richmond for a tuberculosis hospital for colored patients, and the highest rate (\$4.97) represented the average cost for all patients, including tuberculosis, reported for a general hospital in Lawrence. The average for cities in Group I was \$2.51, Group II \$2.33, Group III \$2.49, and Group IV \$2.89.

Comparing the average reported cost per diem per patient according to the agency responsible for the operation of these hospitals or sanatoria, the average per diem for 12 health department institutions was \$3.25; for 20 maintained by other municipal agencies, \$2.53; 21 under county management, \$2.54; 12 operated by State authorities, \$2.09; for 5 private institutions, \$2.51. The per diem cost of treatment is apparently highest under health department administration and lowest in State institutions.

Free treatment for indigent tuberculosis patients is available in many cities, and in some instances municipal authorities pay the hospital expense of city patients treated in State or other institutions. In Massachusetts a proportion of this payment is returned to the city.

SPECIAL PREVENTIVE AND TREATMENT FACILITIES

In at least 78 of the 100 cities, some facilities were available for the care of early cases, suspects and children exposed or predisposed to tuberculosis. These special preventive and treatment facilities included preventoria and summer camps, tent colonies, and other provisions usually intended for temporary care and treatment of selected cases. Many cities maintained special school or classroom facilities and nutrition classes for pupils who were underweight, undernourished or classified as "suspects" or in need of special attention.

Preventoria and camps.—Various facilities classified as "preventoria" were reported as available by 25 cities, eight maintained by antituberculosis societies, six by county hospitals and sanatoria, four by State institutions, four by municipal agencies, the balance by private organizations. The attendance varied from about 6 to nearly 500. In Cincinnati the antituberculosis society maintained a preventorium reporting an attendance of 478 children for a period

of 10 weeks. The average attendance, however, was usually small, many of them caring for less than 100. The total number of patients admitted to 21 preventoria in 1923 was approximately 2,000.

Summer camps, tent colonies, day camps, shelters for early cases or similar facilities were reported as available in 24 cities in 1923. In Worcester, under the auspices of a fresh-air fund, 260 children were placed in country homes, and in Reading several hundred children were given temporary care at a summer farm by the visiting nurse association. In Fort Worth 500 children received the benefits of camp life for a period of three months in charge of a welfare association. The Chicago municipal tuberculosis sanatorium maintains a summer tent colony caring for over a hundred children. In Akron the health department supported a fresh-air camp, with 25 admissions. In Erie, city children were admitted to the shelter provided by the county tuberculosis hospital. A summer pavilion operated by the antituberculosis association in Providence reported 125 beds available. Over 2,600 children were admitted to 17 camps during 1923.

Very little data are available concerning the cost of operation of preventoria or summer camps. The camp for 65 children maintained jointly by the city and county authorities at Fort Worth reported a rate of 60 cents per patient per diem. A camp for 88 children conducted by the tuberculosis league at New Orleans reported a rate of 50 cents per day, while a private camp in Minneapolis with 68 admissions reported the daily cost per patient as \$1.02.

Open-air classes.—Provisions for fresh-air classes in the public schools were reported by 65 cities. These were variously designated as open-air, fresh-air, or open-window classes. Boards of education were chiefly responsible for the conduct of these special classes, receiving some assistance occasionally from the health department and occasionally from private nursing and other agencies. In St. Louis the school board was allotted \$10,000 for this purpose. In Rochester the health department budget carried an item of nearly \$4,000 for carrying on similar activities. The school board of Yonkers reported an expenditure of \$9,501.73 for fresh-air class work.

The number of classes per city varied from 1 to 19, with a general average enrollment of 33 pupils for the 51 cities reporting 279 classes and a total average attendance of 9,137. The total reported enrollment for 57 cities was 10,317, and the average number of classes per city was approximately 5.

SUMMARY AND CONCLUSIONS

While some effort was being made in 1923 in all the 100 largest cities to prevent the spread of tuberculosis either by State, county,

municipal, or private agencies, municipal authorities had not, as a rule, provided adequate facilities for combating the excessive prevalence of this disease.

The average crude death rate from tuberculosis in 1923 was 99.6 per 100,000, as compared with 93.6 for the entire registration area, the highest rate occurring in cities of Group II and the lowest in those of Group III. Southern cities had rates considerably in excess of the average for the entire group or for the registration area.

Reporting of cases was legally required (though not completely enforced) in all but 1 of the 100 cities, concurrent and terminal disinfection in many cities, compulsory segregation in about one-third of the cities, and though antispitting laws were in force in 97 cities only 37 made any effort to enforce them. Tuberculin testing of milk cows and pasteurization of milk are antituberculosis measures in widespread use.

Of the 62 health departments reporting some antituberculosis work, these activities were definitely organized under a separate bureau in only 20 cities, while in 33 they were incidental to communicable disease control or other services, and in 9 they were confined to hospital and clinic care. Only four health departments provided whole-time directors exclusively for tuberculosis control. Of the 38 cities reporting no health department activities, in 9 cities some other municipal department provided hospitals, clinics, or dispensary facilities, and in a few instances field-nursing service, State and county authorities making similar provisions in 15 cities, while in 14 cities only private organizations were engaged in antituberculosis work.

In the 97 cities for which figures on personnel were available for 1923, there were provided by all agencies for tuberculosis control (exclusive of hospitalization) an average of 1.2 physicians per 100,000 population (of which only 7 per cent served whole time) and 4.7 nurses per 100,000 population (about one-third serving whole time). Fifty-eight health departments employed over 60 per cent of all the physicians and almost one-half of all the public health nurses reported as engaged in this work. There were only 27 physicians (24 municipal and 3 private) reported as devoting their entire time to tuberculosis clinics and field service, and 344 (262 municipal and 82 private) serving part time. A total of 559 whole-time nurses (health departments 179, other official agencies 190, and private agencies 190) and 954 part-time nurses (health departments 557, other official agencies 49, and private organizations 348) was reported as engaged in tuberculosis control (exclusive of hospitalization).

In the 97 cities for which figures on expenditures were available for 1923, 54 health departments, 10 other municipal agencies, and

57 private organizations spent altogether an average of 8.3 cents per capita for tuberculosis clinics and follow up; while 15 health departments and 22 other municipal agencies (only 37 cities made expenditures for this purpose) spent 20.4 cents per capita for hospitalization. The total expenditures for tuberculosis control (including hospital care) by municipal agencies in 52 cities amounted to 24.9 cents per capita.

Case reporting, though slightly better than in 1920, was still incomplete, 95 cities reporting an average of 2.1 cases per death from tuberculosis (all forms) in 1923, with a higher average for the larger cities than for the smaller. In 75 cities some provision was made by municipal authorities for the follow up of reported cases, usually by nurses and only 10 cities reported that no such provision was made by either official or private agencies. Verification of diagnosis by laboratory findings was the practice in 41 cities, and by both clinic and laboratory in 30 cities, while a few reported no attempt in this direction. Case cards for tuberculosis cases were used in 55 cities, spot maps in 30, chronological charts in 23, but 29 cities used none of these aids to epidemiologic study. Other measures employed for the control of tuberculosis included placarding in 12 cities, modified isolation in 40, concurrent disinfection in 70, terminal disinfection by cleansing in 50 cities and by gaseous fumigation in 31, bedside nursing care in a number of cities, and some effort toward the vocational rehabilitation of arrested cases was reported by 46 cities.

Fourteen per cent of all home visits by health department nurses was credited to tuberculosis, and an additional percentage charged to other activities should also be credited to this disease. In 30 cities giving fairly complete data, an average of 1,766 tuberculosis visits was made per nurse. Only 37 health departments assigned whole-time nurses exclusively to tuberculosis work, while 33 others used generalized nurses, and private agencies provided both types.

Although tuberculosis clinics were available in all of the 100 cities, with a total of 292 clinics reported, descriptive data were secured for only 150 clinics. Of the latter, 43 were maintained by health departments, 18 by other municipal agencies, 18 by Federal, State, or county authorities, and 71 by private agencies. Incomplete reports give an average of approximately one physician serving in tuberculosis clinics per 100,000 population, less than 8 per cent devoting whole time, and roughly 3.7 nurses, of which only about one-third were engaged wholly in tuberculosis work.

The average cost per clinic patient, in the 15 cities reporting reliable figures, was \$4.29, and the average cost per clinic visit \$1.71.

In 1923 the average number of clinic visits in 54 cities was 2,336 per 100,000 population, or 10.7 per case and 25.1 per death reported

from tuberculosis (all forms); but these averages, though slightly higher than in 1920, are greatly reduced if the two most active cities are omitted. In 42 cities the number of clinic visits per patient was 2.6 in 1923, compared to an average of 2.8 in 1920.

Hospital facilities for the tuberculous, more or less adequate, were provided by one or more agencies in each of the 100 cities: By the health department in 16 cities, by other municipal departments in 39, by county authorities in 44, by State agencies in 53, and by private organizations in 36 cities. Approximately 60 beds were available per 100,000 population, or 58 beds per 100 deaths from tuberculosis in 1923 as compared to 50 in 1920. Estimates from 47 cities indicate that the majority of these hospitalized at least one-third of their tuberculosis cases. In 63 cities there were admitted 1.8 patients per bed in 1923, or an average length of stay of 6.8 months per patient as compared to 6.2 in 1920. The cost of hospitalization in 51 cities averaged \$2.58 per patient per day, the highest cost (\$3.25) being reported for health-department institutions and the lowest (\$2.09) for State hospitals.

In at least 78 cities some facilities were provided by various agencies for the care of early cases, suspects, and children exposed or predisposed to tuberculosis. These consisted of preventoria in 25 cities, camps or tent colonies in 24 cities, and open-air classes in the public schools in 65 cities.

B. General Discussion of Some of the More Essential Problems Concerned in the Prevention and Control of Tuberculosis

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Because of its ubiquity, its chronicity, its protean manifestations, the age period of its prevalency, the stupendous economic cost, the medical and sociological factors, and the obscurity of the infection, tuberculosis remains the most highly technical and specialized problem in public health practice.

The great reduction in mortality during the last 20 years from 200 per 100,000 in 1904 in the registration area to 94 per 100,000 in 1923 has led a great many of the unthinking in public health work to the belief that tuberculosis is practically conquered. A general review of the situation in the United States will indicate the fallacy of such a belief.

MUNICIPAL RESPONSIBILITY

It is everywhere recognized that tuberculosis, because of its communicability, is a governmental responsibility. However active a voluntary association may be, and however efficient its work, the

official bodies must, in the last analysis, be held responsible for the control of this disease. To meet the problem adequately, it is essential to have in the municipal department of health a physician thoroughly familiar with tuberculosis in its medical and social aspects. Whether or not this physician should direct a separate bureau or head a division in the bureau of communicable diseases, is perhaps a matter for debate. Certainly, it would seem that in larger cities a separate bureau of tuberculosis would be preferable.

SUPERVISION OF CONTROL MEASURES UNDER QUALIFIED LEADERSHIP

It is futile to expect that the average director of a bureau of communicable diseases will be necessarily qualified to handle tuberculosis work efficiently. Under such an administrative policy tuberculosis might be relegated to a secondary place in the general program or almost entirely neglected. A very different attitude of mind and a different training are required in the activities for the control of communicable diseases, such as smallpox, scarlet fever, or typhoid fever, than are required in the work of tuberculosis control. Epidemics of the acute diseases occur not infrequently with great suddenness. They often present spectacular and dramatic features. The public's attention is focused on the epidemic and on the two individuals chiefly responsible for its control—that is, the health officer and the director of the bureau of communicable diseases. Reporters of the public press are at his desk morning, noon, and night, harassing him for feature stories. The editorial columns will commend and support him or adversely criticize him, according to the severity of the epidemic, and, in some measure, according to the way he manages the reporters, even more than the way he may manage the epidemic. The director must act quickly and energetically in the emergency. When the disease is brought under control he may relax, and then prepare for the next acute outbreak. Before he can change his attitude of mind and take up the age-old problem of tuberculosis, a new epidemic of acute disease is likely to break out. During the acute epidemic he has not had time to consider tuberculosis. In point of fact he may have had to take from their accustomed duties those nurses engaged more particularly in tuberculosis work and draft them for emergency service in the epidemic.

Tuberculosis, on the other hand, requires quiet plodding. The disease presents few dramatic features. There is very little public interest in it. The appearance of a single case of leprosy in a northern community will excite more comment than a dozen cases of tuberculosis, although it is very much less infectious. Sixty annual tuberculosis deaths in a given community will little disturb the public, but 40 deaths from typhoid would result in excited meetings of citizens and city fathers.

Reference to some of the duties of the physician responsible for leading the forces arrayed against tuberculosis presents further evidence of the futility of expecting a director of a bureau of communicable diseases to meet the situation. It is an axiom in the public health field that it is impossible to control a communicable disease without knowing the location of cases. Adequate case-finding and case-reporting, therefore, are of paramount importance. There is no disease, with the exception of venereal disease, that physicians will report with greater reluctance. In a great many departments of health, the file records and spot maps of acute contagious diseases are well kept, while in nearly all departments of health the tuberculosis records are almost worthless. Continued effort directed toward the practicing physician is necessary to secure these reports. Admonition, cajolery, diplomacy, and sometimes prosecution, are required to induce physicians to obey the simple terms of the law that applies in nearly every State in the Union to the reporting of tuberculosis. Only a physician is capable of this sort of effort among physicians.

THE IMPORTANCE OF CASE-FINDING

The numerous sources of information concerning existing cases have not usually been fully utilized. It may not be amiss here to list some of these sources. First, of course, there are the practicing physicians already mentioned. Then, too, the municipal laboratory retains duplicates of all reports sent to physicians regarding negative specimens. It is unlikely that a practitioner would send a specimen unless he suspected tuberculosis, and such suspects should be listed in the files of the department for follow up. The general hospital should be required always to report cases of tuberculosis that have been admitted for treatment. All diagnostic clinics should, of course, be required to report their findings to the health department. The suspects found by nurses are an excellent source of information when the suspected diagnosis is confirmed by a medical examiner. Likewise, neighbors occasionally report suspected cases. The Veterans Bureau employees are now required to report every case of tuberculosis to the health officer in the territory where cases are found. That energetic and unremitting effort will result in a working knowledge of the location of tuberculosis cases has been proved in such large cities as Chicago and Detroit. The methods used in Chicago, as described by Jonas⁹ have been particularly successful.

The case records of tuberculosis in the files of the department must be kept up to date, not only as to deaths and removals occur-

⁹ Law Enforcement in the Control of Tuberculosis," Edgar A. Jonas. American Journal of Public Health. February, 1923, page 113.

ring from time to time, but as to the general condition of the patients, whether or not the disease in each case is known to be active and whether or not it is an open case discharging tubercle bacilli. Likewise, the dispensary records of cases are exceedingly important. It has been said repeatedly by those of large experience that case records, including medical and social histories in hospitals and dispensaries, are a fair index of service rendered. It should be a duty of the director of a division of tuberculosis to supervise the case histories in municipal clinics, and, in view of the communicability of the disease, it is believed that it should be a prerogative of the health department to inspect the records in general hospitals and the records in sanatoria.

It should be the duty of the director to see that, as a preventive measure, all children and young people in families of tuberculous patients are examined and appropriate measures taken, such as placement in "open-air" schools, nutrition classes, preventoria, sanatoria, etc. In other words, he should build up the case-finding machinery of the community. The director should encourage all practicing physicians to make the fullest possible use of the laboratory for the examination of sputum and other excretions for the presence of tubercle bacilli.

PART-TIME CLINIC PHYSICIANS IN SMALLER CITIES

In smaller cities it is probably necessary to depend on the part-time services of practicing physicians for the examination of clinic patients. A reasonable fee for such service should be paid by the department of health in municipal clinics and arrangements should be made whereby there would always be a physician in attendance. If for any reason the regularly employed physician should be absent from the clinic, he must provide a substitute. Nothing tends more to hamper the work of nurses in bringing cases for examination than the absence of the physician during the regular clinic hours. The experience of some of the larger cities indicates that the clinical expert employed on full time gives better service than a number of part-time physicians.

THE PUBLIC HEALTH NURSE, AN IMPORTANT FACTOR

The public health nurse has been declared to be the key person in modern public health practice. She is an exceedingly important factor in the tuberculosis case-finding campaign. If the generalized plan of public health nursing has been adopted in a community, the health department must work to secure enough nurses to care adequately for all public health problems, including tuberculosis. Under the medical director of tuberculosis activities there should be a

nurse supervisor thoroughly trained in tuberculosis work. Where the generalized plan of nursing exists, the director should see to it that a proper proportion of the activities of the nurses is devoted to tuberculosis work.

If the major part of the nursing service is done by the Visiting Nurses Association or by the nurses of voluntary nursing organizations, the director must see that the instructive and hygienic service rendered is adequate, this again being an official responsibility. In such States as Connecticut, where the law permits the private physician to assume the responsibility for the instruction of tuberculosis patients, the department of health should see to it that the private physician fulfills his obligation.

Only one city, New Haven, appears to have anywhere near an adequate number of public health nurses, general and specialized, to meet the demand for their services; and it is generally the fact that with an inadequate number of public health nurses in a community, tuberculosis is the problem most likely to suffer neglect.

TUBERCULOSIS WORK TO BE COORDINATED WITH OTHER SERVICES

In cooperation with the inspection service of the department of health, the director of tuberculosis activities should institute such measures as may be necessary to assure freedom from tuberculosis among the handlers of milk and other foods and among school teachers. In cooperation with the bureau of child hygiene in its prenatal work, he will search out those expectant mothers who are tuberculous or are likely to become tuberculous, and offer them instruction as well as every facility for such institutional care as will tend to prevent the advancement of tuberculous disease. He will see also that the follow-up service for those discharged from sanatoria is adequate.

The director of a division of tuberculosis should be the leader of the campaign of education concerning this disease. He should edit a section of the bulletin of the health department and the publication of the volunteer group in his community. He should in fact do all in his power to correlate the official and volunteer programs.

THE COUNTY AS THE LOGICAL BASIS FOR TUBERCULOSIS CONTROL MEASURES

In a discussion of tuberculosis control in a given city, it seems necessary to the writer to consider the county and its relationship to the city involved. The county is coming more and more to be recognized as the logical governmental unit to undertake an effective control of tuberculosis, as well as the acute epidemic diseases. The campaign for the development of sanatoria is now being directed chiefly

toward the establishment of county sanatoria. With the exception of the largest cities, municipal sanatoria are not considered as fully meeting the demands of the situation.

Many counties have one city that holds within its borders the great majority of the population of the surrounding county. On the other hand, there may be in a county two or three cities of modest size. Building a sanatorium in the one large city or in each of the small cities leaves the surrounding territory without any readily accessible institutional facilities. Usually, the municipal sanatorium is inadequate in size to meet its own problem and county authorities are unable to purchase bed space for their cases. To build two or three municipal sanatoria in a single county involves not alone a waste in first costs, but also in administrative costs. In many cases such sanatoria would be too small to warrant the employment of a full-time, trained medical director. The county sanatorium, therefore, seems to meet best the usual requirements of the situation.

The county sanatorium, where it exists, should be the center of tuberculosis activities for the county. The medical director could well serve as the director of a division of tuberculosis in the municipal board of health of the large city in his county, and for that matter, he could serve in the same relationship for two or three small cities in his county. This is essentially the situation as it exists in Summit County, Ohio and in the city of Akron. A summary of the activities of the Medical Director of the Springfield Lake Sanatorium, while in part a repetition of the already stated functions of a director of tuberculosis control, is worth while as indicating the possibilities of cooperation between the county sanatorium and the city health department.

COOPERATIVE ARRANGEMENTS BETWEEN COUNTY AND CITY AUTHORITIES

The medical director and staff of Summit County Sanatorium have charge of the tuberculosis clinic in Akron, as well as in other sections of the county. Once each week, clinic cases requiring an X-ray examination, fluoroscopic or photographic, are taken to the county sanatorium by nurses. Sputum and other specimens for examination are sent to the clinical laboratory of the sanatorium. The county medical director acts as a clinical consultant to the school physician in the examination of children suspected of being tuberculous. He also supervises the home treatment of those cases of active disease who are awaiting admission to the sanatorium, or who, for one reason or another, can not or will not go to the sanatorium. A social investigator, employed by the sanatorium, visits the homes of prospective patients and keeps the families of

those patients who are under treatment in sanatoria informed of the progress of treatment and directs the family in the preparation for the aftercare of the patient when he is discharged. The medical director examines those children who are believed to require treatment in the summer camp for undernourished children. He directs an educational campaign concerning tuberculosis among the people of the county, presenting moving-picture reels of life at the sanatorium and depicting various means of controlling the disease. He also arranges for lectures by himself and staff members before medical and lay audiences, and, if requested, he acts as clinical consultant for general practitioners.

THE SANATORIUM AND DIAGNOSTIC CLINIC

The tuberculosis sanatorium is the most highly developed of the measures for the treatment and control of tuberculosis, and yet in most States the number of sanatorium beds is wholly inadequate to meet the needs. Applying the conservative formula of one bed for each annual death, some cities and counties have not even half enough beds.

The next important device in the control of tuberculosis is, perhaps, the diagnostic clinic. It is notorious that the tuberculosis clinics are insufficient in number, and generally inefficient in administration.

Reference to the statistical studies will reveal the fact that only 27 of the 100 large cities reported having preventoria; 56 cities reported none, and for 17 cities no figures were received. Presumably these 17 have no preventoria. Thirty-one cities reported no "open air" schoolrooms. Only 14 cities reported having fresh-air camps.

THE COST OF MUNICIPAL CONTROL

The cost of maintaining a division of tuberculosis is difficult to determine. Such figures as relate to existing conditions are of little value for comparative purposes, because there are not at hand sufficient data concerning the items of expense that have been included in several cities. The per capita costs for a separate bureau range from six-tenths of 1 cent in Philadelphia to \$0.494 in Yonkers. The cost of an adequate nursing service, for example, would depend on whether or not the department of health intended to provide all the required nursing through specialized tuberculosis nurses, or only a part of this service, relying upon some existing voluntary organization to supply the balance. It is perhaps worth while only to suggest the cost of actual administrative service, without attempting to estimate the cost of nurses and others in the direct field work.

A qualified director of a division of tuberculosis would require a salary ranging from \$3,800 to \$5,000; the tuberculosis supervisor of nurses would command a salary of from \$2,000 to \$3,000; a secretarial stenographer could be secured for from \$1,200 to \$1,800. Adequate transportation should be provided for the director and the nurses. The yearly maintenance of an automobile would range in cost from \$500 to \$600. The sanitary supplies would require an appropriation of \$500 to \$1,000.

VII. VENEREAL DISEASE CONTROL

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INTRODUCTION

The venereal-disease section of the Survey of Municipal Health Department Practice in the United States in 1923 will be most significant if studied in comparison with the similar report for the year 1921.¹ The report has been prepared for the Committee on Municipal Health Department Practice² on the basis of field studies by officers and representatives of the United States Public Health Service. One hundred cities of 70,000 population and over were visited to secure the data outlined in the questionnaire. It is hoped that the detailed tabulation of material following will be useful as an encouragement and a challenge to further effort.

The reasons for encouragement appear when one realizes that out of 227 cities surveyed in 1913 only 7 cities required reporting of venereal diseases, 4 had free venereal-disease clinics, and only 3 provided even hospital care for dangerous cases. In 1913 one city examined food handlers for venereal diseases, and only 46 out of the entire group provided free laboratory diagnostic facilities for syphilis. It is also true that in 1913, 8 of the larger cities still had official methods for inspecting prostitutes as a venereal-disease-control measure, and that general health education measures regarding venereal diseases were practically nonexistent. By contrast, 99 per cent of the cities studied in 1923 have regulations for notification and show increasing use of reports; 82 per cent have free laboratory diagnostic facilities; 100 per cent provide free clinical treatment, in many instances to the full extent necessary; 65 per cent provide hospital or other facilities for isolation of dangerous cases; 79 per cent recognize the venereal diseases as one of the major subjects in their public-health education programs. To-day only four States in the Union have failed to pass the abatement and injunction law, and every city officially recognizes the soundness of the policy of eliminating commercialized prostitution and the fallacy of attempting to

¹ Report of the Committee on Municipal Health Department Practice, United States Public Health Service, Public Health Bulletin No. 136. Chapter V. Venereal-Disease Control. By Mary A. Clark, statistician, American Social Hygiene Association, Washington, 1923. Also published as a reprint from Journal of Social Hygiene, Vol. IX, January, 1923. Publication No. 382.

² Report prepared by the American Social Hygiene Association.

control venereal diseases by any system of periodic examination of prostitutes.

The challenge for greater effort lies in the very evident danger of slipping back into a state of public indifference toward the problem because of its complexities and the difficulty of holding its proper place in competition with the many other and new appeals for money and personnel to promote health-conservation activities. An amazing amount has been accomplished in setting the stage for big results and preparing the public to understand and support the work to be done, but only a beginning has been made toward what may reasonably be expected in the next decade.

In analyzing the data reported by the 100 cities included in the 1923 survey on municipal health department practice, the cities have been studied by population groups. Group I consists of 12 cities² with a population of over 500,000; Group II, of 16 cities⁴ with a population of 250,000 to 500,000; Group III, of 50 cities⁵ with a population of 100,000 to 250,000; and Group IV, of 22 cities⁶ ranging in population from 70,000 to 100,000.

In practically all instances the report is based only upon data furnished by the questionnaires used in the investigation. Unless otherwise indicated, statements in the report refer to the year 1923.

In the summary of general conditions, estimates have had to be based on the number of cities reporting rather than upon the total number of cities included in the survey. This is because most of the reports omit statements on some important points. While the information furnished on many items is extremely meager, or ambiguous, or difficult to interpret, yet there is a great deal of valuable information in the reports taken collectively.

The detailed report is made in eight sections, as follows: (1) Health Department Activities, (2) Federal and State Aid, (3) Non-

² (1) Baltimore, (2) Boston, (3) Buffalo, (4) Chicago, (5) Cleveland, (6) Detroit, (7) Los Angeles, (8) New York, (9) Philadelphia, (10) Pittsburgh, (11) San Francisco, (12) St. Louis.

⁴ (13) Cincinnati, (14) Columbus, (15) Denver, (16) Indianapolis, (17) Jersey City, (18) Kansas City, Mo., (19) Louisville, (20) Milwaukee, (21) Minneapolis, (22) Newark, (23) New Orleans, (24) Portland, (25) Rochester, (26) Seattle, (27) Toledo, (28) Washington.

⁵ (29) Akron, (30) Albany, (31) Atlanta, (32) Birmingham, (33) Bridgeport, (34) Cambridge, (35) Camden, (36) Dallas, (37) Dayton, (38) Des Moines, (39) Duluth, (40) Elizabeth, (41) Erie, (42) Fall River, (43) Flint, (44) Fort Worth, (45) Grand Rapids, (46) Hartford, (47) Houston, (48) Jacksonville, (49) Kansas City, Kans., (50) Lowell, (51) Lynn, (52) Memphis, (53) Nashville, (54) New Bedford, (55) New Haven, (56) Norfolk, (57) Oakland, (58) Oklahoma City, (59) Omaha, (60) Paterson, (61) Providence, (62) Reading, (63) Richmond, (64) St. Paul, (65) Salt Lake City, (66) San Antonio, (67) Scranton, (68) Spokane, (69) Springfield, (70) Syracuse, (71) Tacoma, (72) Trenton, (73) Tulsa, (74) Utica, (75) Wilmington, (76) Worcester, (77) Yonkers, (78) Youngstown.

⁶ (79) Allentown, (80) Bayonne, (81) Canton, (82) El Paso, (83) Evansville, (84) Fort Wayne, (85) Harrisburg, (86) Knoxville, (87) Lawrence, (88) Manchester, (89) Peoria, (90) St. Joseph, (91) San Diego, (92) Savannah, (93) Schenectady, (94) Sioux City, (95) Somerville, (96) South Bend, (97) Troy, (98) Waterbury, (99) Wichita, (100) Wilkes-Barre.

official Agencies, (4) Notification, (5) Prophylactic and Preventive Measures, (6) Treatment, (7) Legal and Protective Measures, (8) Educational Campaign.

A few of the leading points brought out by the survey are summarized in the following paragraphs.

SUMMARY OF FINDINGS

Over a third (34) of the hundred cities studied have a separate bureau or division of venereal diseases. In approximately 40 additional cities the venereal-disease work reported is not specified as being under a separate division, but is mentioned in relation to clinic service provided by the health department. A few other cities specifically group their activities under other departments than the health department. Only 11 cities report no definite program for the control of venereal diseases.

As to expenditure of public money for venereal disease control, excluding hospitalization, it was found that the average city made a per capita expenditure of 1.4 cents. Approximately half spent between 1 cent and 3 cents for this service. The average per capita expenditure for venereal disease field service for all cities is 2.7 cents.

Over a fourth of the cities state that they receive Federal aid in some form, usually through the State; approximately three-fourths receive State aid; and only one-fourth receive neither Federal nor State aid.

In nearly half of the cities there are nonofficial agencies more or less active in some form of venereal-disease work. In 30 cities such agencies definitely cooperate with the official agencies; 7 cities state that these agencies do not cooperate with official agencies.

With the exception of Washington⁷ and Salt Lake City⁸ all of the cities included in the survey state the existence in 1923 of laws for the notification of venereal disease. In addition, over half of the 85 cities specially reporting on this point have municipal ordinances for carrying out or supplementing provisions of the State law. Replies from over a third of the cities state that name and address are required in the first report; while in over half an office number is required. Of this latter group 22 cities, or 39 per cent, require a second report giving name and address in case the patient fails to continue treatment.

Sixty-four cities state that probable sources of infection are customarily or "sometimes" reported to the city health department;

⁷ EDITOR'S NOTE.—In 1925 Congress finally passed a law providing for venereal-disease control in the District of Columbia.

⁸ EDITOR'S NOTE.—Contrary to this report, notification has been compulsory in Utah by State law since 1919.

and nearly three-fourths of these follow up such reports. Five per cent definitely state that they do not follow up the reports.

Nearly two-thirds of the cities state that their report cards call for information on chronic gonorrhea, and a slightly larger number show fresh cases. About one-third indicate that they record information as to the number of previous attacks. In regard to syphilis, about one-third ask supplemental information about recurrent attacks. About one-sixth ask for reports regarding the prior use of chemical prophylaxis.

It is interesting that 79 cities furnish data regarding whether an increase or a decrease in the number of physicians who report cases has been noted. Fifty-six per cent state that there has been an increase; 20 per cent have noted a decrease; while 22 per cent are of the opinion that no change had occurred; one city "noted fluctuations," and one city had "dropped reporting during the period." In view of the fact that 56 per cent report an increase in the number of physicians reporting, it is interesting to note that the venereal morbidity rates for 1919 and 1923 are practically the same. Taking into account a like increase in the number and size of clinics reporting cases, this similarity in rates may be indicative of a tendency toward a decrease in incidence.

In all of the cities included in the survey (except the 10 Massachusetts cities) provision for isolation and quarantine is made under State law. Over two-fifths of the 85 cities reporting on this point state that they regularly enforce such measures; one-fifth that they "rarely" or "sometimes" enforce these measures; the remainder that they do not enforce measures of this kind.

Fifty-two cities examine "food-handlers, barbers, etc.," as routine procedure, or "sometimes," or "on suspicion."

Only 16 cities (approximately one-fifth of the 94 reporting) make provision for chemical prophylaxis through the health department; some 30 cities express advocacy of such measures; the remainder state that they do not advocate these measures.

Diagnostic facilities are provided in 95 cities. Over four-fifths of these provide Wassermann tests, while dark field examinations for syphilis are reported by over two-fifths. Smears for gonorrhea are noted by approximately four-fifths of these cities, while only about one-tenth report complement fixation tests.

All of the cities had one or more venereal-disease clinics in 1923 maintained by the city, State, or voluntary agencies. Nearly three-fourths of these are reported as wholly or partially maintained from city health-department funds. Over half of the cities receive some support or other assistance in the treatment of venereal diseases from the State.

Hospitalization facilities are provided in more than four-fifths of the cities.

All of the cities have general nursing service for venereal disease patients in either hospitals or clinics or in both, and nearly a third have one or more whole or part time nurses doing field work. Over one-half (56) provide one or more trained social workers assigned to the follow-up of patients who discontinue treatment and to the investigation of home conditions.

Some interesting information has been obtained in regard to the practice of quacks in 87 cities. Only one-fifth of these report such practices as extensive now, while two-fifths of the cities definitely report that such practices are not extensive. The remaining cities reply in various ways concerning this question, such as "average," "decreasing," "none." Twenty-six cities indicate extensive use of nostrums for venereal diseases; 16 reply "not extensive"; 9, "average"; the remainder use various expressions which indicate that no extensive use has been noted.

There are 95 cities which report on control of sex offenders. In 84 per cent of these some action is taken while in 16 per cent practically nothing is done. However, in no instance (97 reporting) is there mentioned a recognized vice district, although 4 cities report conditions closely approaching such districts.

Of the 82 cities providing data on the prevalence of prostitution, 21 per cent report "prostitution extensive." Sixty-two per cent report in such terms as "less than average," "moderate or fairly extensive," "decreasing," or "clandestine," while 2 per cent report "none." The remaining 15 per cent report that it is "impossible to estimate the extent."

An interesting fact brought out by the survey is that 43 cities, or 69 per cent of those commenting specifically on responsibility for the control of the vice situation in a city, state that it rests with the police department. Ninety-one per cent of these 90 cities reporting indicate that arrests are generally made of sex offenders "when circumstances justify." Only 3 per cent report "that sex offenders are not arrested"; the remaining 6 per cent report "arrests in some cases."

Ninety-one per cent of the 82 cities reporting arrests of sex offenders state that examinations are made for venereal-disease infections. Twenty-two cities report that all persons arrested for sex offenses are examined.

Some interesting facts were disclosed in reference to examinations for neuro-syphilis: 22 cities regularly examine criminals to detect neuro-syphilis; 10 cities similarly examine persons responsible for serious accidents; 14 regularly examine "loafers"; and 7, "anar-

chistic agitators." Approximately one-third of the cities receive reports from nonvenereal-disease clinics regarding neuro-syphilis or "late manifestations." The remainder of 88 cities reporting on this point have no regular examinations for neuro-syphilis.

Sixty-two cities require infected persons to be detained for treatment.

Fifty-nine cities make some attempt at institutional reform of sex delinquents, and 67 give some care to unmarried mothers.

Of the 75 cities reporting supervision of dance halls and theaters, 77 per cent leave such supervision to the police department or to special city inspectors.

Eighty-seven per cent of the cities (86 reporting) have probation officers; 74 per cent have one or more women police officers.

Some of the definite opinions concerning the attitude of official and nonofficial groups toward venereal-disease control measures are informing. In 77 per cent of the 91 cities reporting, the police are definitely cooperative toward the general program for control of venereal diseases, while in 12 per cent they are definitely opposed to such work. In 83 per cent the attitude of the courts is distinctly favorable, while in 10 per cent it is unfavorable. Nearly two-thirds of the cities giving information on this point report physicians as generally cooperating in such venereal-disease programs as exist, while a quarter of the cities report physicians as uncooperative. Information obtained concerning the attitude of the public toward the program for venereal-disease control is less promising. Only 45 per cent of the 86 cities reporting on this item state the attitude of the public as cooperative, while 41 per cent report the program as unpopular with the public.

The statements made under the general heading "Educational Campaign" are too various and too indefinite to combine in any general evaluation of educational activities. Only a fourth of the cities (95 reporting) note efforts toward sex education in schools; a fifth report work in sex education in churches. Nearly a third state that sex education work is done by societies, such as social hygiene societies, Visting Nurses Association, the Red Cross, the Boy Scouts, and Camp Fire Girls. Three-fourths of the cities mention the use in some degree of pamphlets, and of exhibits and motion pictures. Two-fifths of the cities make special mention of "Keeping Fit Campaigns." "Newspaper publicity" is another activity of an educational nature mentioned. Less than a third of the cities have literature on the subject of "sex hygiene" in their libraries.

It is interesting that of the 80 cities which report on progress in educational activities one-half evaluate their efforts as "fair," while one-fourth estimate that they have made "no accomplishment along

educational lines"; the remaining cities report results as "limited," or "impossible to estimate."

As has already been indicated, replies to various important questions are lacking for a large number of cities. Just what significance should be attached to these failures to report can only be surmised, but they have made it extremely difficult to give comparable data for all the cities.

A few instances will illustrate the difficulties the reader will encounter in using the text of the full report.

Of the 89 cities reporting some sort of program for the prevention and control of venereal diseases, only 53 report as to the effectiveness of the program. Of the 82 cities indicating that arrests of sex offenders are made when circumstances justify, only 37 report the total number of arrests of this character in 1923. Fifty-five cities give very incomplete data as to provision of activities other than those specially designated, while 20 do not report on the question of accomplishment through the educational program. Nineteen cities make no report as to institutional reform of sex delinquents, and 16 furnish no data concerning care given to unmarried mothers. No report is made by 12 cities as to regular examination of criminals to detect neuro-syphilis. Twenty-three cities give no information in regard to the item for provision of beds for venereal-disease patients in hospitals. Of 33 cities reporting one or more whole or part-time nurses engaged in field service, only 15 report the specific number of visits made. Fifteen cities give no data as to Federal aid. Nineteen cities furnish no data in regard to the number of physicians reporting.

The foregoing statement is intended to give a brief picture of the high points of the survey. It is believed that the inclusion in the detailed report of the names of cities illustrative of various methods used adds to its effectiveness as a source book. In order to save space the footnotes are expressed in numbers, the key to which can be found at the bottom of page 204. As such it may be useful both for comparison with the 1921 survey data and for setting up a plan for further development of the program. In this latter connection the survey seems to justify the following as the practical basis for the current ideal municipal health department practice in combating venereal diseases.

I. Efforts to find all cases as soon as possible after infection, and to decide in each case what measures will best protect the public from infection.

1. Provision of clinical examination and advice facilities, to encourage persons believing that exposure or infection may have occurred, promptly to obtain proper advice and instruction.

2. Provision of diagnostic laboratory facilities, to aid physicians and staff of clinics and hospitals to make diagnosis of syphilis and gonorrhea.

3. Provision of case study facilities to enable the responsible official or physician to determine on the basis of the circumstances in each case what, if any, special aid, restrictions, isolation, or quarantine measures may be required.

II. Efforts to secure effective treatment of each case with due regard to avoiding the infection of other persons.

1. All necessary assistance to private clinics, hospitals, and physicians in providing treatment and follow-up service for infected persons.

2. Health department clinic facilities to supplement so far as necessary the venereal disease work of private clinics and physicians and of hospitals.

III. Efforts to inform the public regarding the dangers, modes of infection, and methods of prevention of these diseases, and to induce them to apply this knowledge to their protection individually and collectively—

1. Specific instruction pamphlets furnished to patients and those exposed to infection to insure understanding of their problem.

2. Health education measures to inform the general public regarding the dangers and control of venereal diseases.

IV. Efforts to obtain and record data related to the carrying out of the program and to evaluating the effectiveness of each measure adopted—

1. Reporting of venereal diseases by identification symbol, under such conditions as may prove necessary in relation to each of the group of cases, arranged according to means of transmission.

2. Supplementing notification by follow-up data on cases in relation to discharge, transfer to other physicians or clinics, or causes for lapse from treatment.

3. Tabulation of data collected for administrative use in reference to diagnosis, treatment, cure, infection of others, securing diagnosis and treatment of contacts, and similar questions.

The survey shows that all of these measures are in operation in many of the cities studied, and that most of them are in process of modification and amplification along lines which promise steady and notable advance.

In general, health departments, professional groups, and voluntary agencies all seem to be working encouragingly toward an understanding of their respective parts in this program and their

necessary interdependence. The survey also gives promise of the ultimate working out of the relations of these public health aspects of social hygiene to the other phases of that movement which have to do with social and moral questions of marriage and sex conduct. These latter questions, of course, have not been covered by the survey except in so far as the facts bearing on measures in operation for the control of venereal diseases may incidentally relate to them. Likewise the summary just outlined under the heading "Current ideal municipal health department practice" does not mention the many important and powerful influences and measures that the cities are developing under other departments of administration which tend to make commercialized vice less accessible and patrons of prostitution less numerous. Such activities supported by the churches, the schools, and voluntary agencies for character education and training are steadily making progress calculated to greatly reduce the number of exposures to the venereal diseases in future generations.

HEALTH DEPARTMENT ACTIVITIES

Of the 100 cities included in the survey 34⁹ report a separate bureau or division of venereal diseases. A few of the remaining specifically group their venereal-disease activities under other city departments—Baltimore, Boston, Columbus, New Orleans, Bridgeport, Memphis, Richmond, and Waterbury, under the division of communicable diseases. At least 40 of the remainder state that such venereal-disease activities as exist are under the direction of the head of the clinic. In Omaha the social service board is in charge. Fifteen additional cities report neither special health department bureau nor clinic, but other activities of a limited nature. Seven of these—Boston, Cambridge, Camden, Fall River, Memphis, Worcester, and Somerville—report follow up of lapsed cases; Reading, "enforcement of quarantine and isolation; follow-up work and placarding of lapsed cases"; and Bridgeport, "reporting of cases; hospitalization when necessary; laboratory diagnosis and follow-up work." Canton states that the "health department forces known cases to take treatment"; Sioux City, that "patients are referred by the health department to physicians." Denver and Fort Worth report treatment to prisoners in the city jail, and Minneapolis, "examination of court cases, when requested by a judge, and treatment at the workhouse," while the report from Atlanta is to the effect that "control of venereal diseases is limited largely to sources of infection through treatment in local clinics and detention of sex offenders." In 11 cities¹⁰ reports seem to indicate no definite program for the control of venereal diseases.

⁹ 3, 4, 6, 7, 8, 11, 12; 13, 16, 19, 20, 22, 26; 29, 39, 40, 45, 47, 48, 53, 54, 55, 56, 57, 60, 64, 70, 74, 77; 84, 86, 91, 92, 96.

¹⁰ 10; 30, 41, 51, 61, 67, 73, 78; 80, 85, 90.

EFFECTIVENESS OF PROGRAMS

Certain statements have been made regarding the effectiveness of existing programs. As previously stated, reports from 11 cities indicate no activities. Of the 89 others, 53 report as to effectiveness. Two of these—Tacoma and Knoxville—believe their efforts to have had “excellent” results; 25 others,¹¹ “good”; one city, Flint, “fair; efficiency increasing”; Oakland, “not effective.” The 24 remaining cities reporting on effectiveness emphasize special phases of program results. For example, Kansas City (Mo.), Elizabeth, Trenton, Lawrence, Nashville, and Chicago mention accomplishment in securing greater attendance at clinics. Fort Wayne reports a “marked reduction in new cases,” which would seem to indicate progress in prevention. Boston, San Antonio, and Jacksonville have specially noted effective follow-up work by the health department. Los Angeles reports “Prostitutes to the number of 500 are quarantined and treated until rendered noninfectious, and about the same number of men are thus treated in jail.” San Francisco, Hartford, Norfolk, and Peoria are apparently unable to evaluate in any way the effectiveness of the various program activities and reply that the degree of effectiveness is “unknown.”

PERSONNEL

In most cases the personnel listed is doubtless furnished by the city health department. However, in a few the providing agency is not clear. While all personnel have been combined in one group, special note should be made in the total of the fact that 18 workers at least are partially paid by other agencies than the city health department.

As shown by Table I, 81 cities report a total personnel of 436 engaged in venereal-disease activities. Of these, 97 are designated as persons in charge of venereal-disease activities with the following titles: Nine are designated director or chief of bureau; 11 are “health officers,” one of these in El Paso being a county health officer; 30 persons in charge are termed simply “physicians,” no rank being given; 41 are classified as “clinic heads”; and the remaining 6 persons are variously designated. Milwaukee, for example, has a “medical superintendent”; Seattle a “medical inspector.” Omaha has a social-service board, of which a woman is executive secretary; Paterson, a “protective officer.”

Of the 339 other persons engaged in these activities, 99 are physicians, 128 are nurses, 15 are social workers, and the remaining 97 persons are miscellaneous in character—stenographers, clerks, inspectors, attendants, and the like.

¹¹ 3, 6, 12; 16, 22, 25, 26; 29, 32, 39, 42, 45, 52, 59, 60, 64, 65, 74, 75; 88, 91, 94, 96, 98, 99.

Information as to time spent by these persons is lacking in many instances. However, it is possible to say that of the 97 persons in charge of venereal-disease activities, 20 give whole time to the work; 57, part time. Of the 99 physicians listed among personnel other than persons in charge of venereal-disease activities, 42 are noted as giving only part time to the work. Of the 128 nurses listed, 11 are noted as giving whole time; 9, part. Of the 97 persons constituting a miscellaneous group, 11 are noted as part-time workers.

TABLE I.—*Personnel engaged in venereal-disease activities in 81 cities, 1923*

Number of workers rang- ing from—	Cities
1 to 2.....	Denver, Kansas City (Mo.), Milwaukee, New Orleans, Washington, D. C., Dallas, Flint, Memphis, Oakland, Paterson, Reading, Salt Lake City, Springfield, Tacoma, Peoria, Schenectady, Sioux City, Troy, Wichita.
3 to 5.....	Boston, Buffalo, Cincinnati, Columbus, Louisville, Portland, Rochester, Seattle, Birmingham, Bridgeport, Dayton, Duluth, Elizabeth, Grand Rapids, Hartford, Jacksonville, Kansas City (Kans.), Lowell, New Haven, Norfolk, Richmond, St. Paul, San Antonio, Spokane, Trenton, Utica, Wilmington, Yonkers, Allentown, Bayonne, Evansville, Fort Wayne, Knoxville, Lawrence, San Diego, Savannah, South Bend, Waterbury.
8 to 10.....	Cleveland, San Francisco, Indianapolis, Akron, Albany, Houston, Nashville, New Bedford, Oklahoma City, Omaha, Syracuse, El Paso, Manchester, Wilkes-Barre.
11 to 15.....	Baltimore, Jersey City, Toledo.
16 to 20.....	Los Angeles, New York, St. Louis.
21 and over....	Chicago, Detroit, Newark.

EXPENDITURES

In a study of data collected in this same survey on expenditures for public health work,¹² made by Dr. Allen W. Freeman, it was found that in 1923 the average city made a per capita expenditure for control of venereal disease, excluding hospitalization, of 1.4 cents. Approximately half of the cities spent between 1 cent and 3 cents for this service. The average per capita expenditure for venereal disease field services in cities of Group I was 1.9 cents; in cities of Group II, 2.6 cents; in cities of Group III, 3.2 cents; and in cities of Group IV, 3.3 cents. The corresponding figure given for all cities is 2.7 cents.

FEDERAL AND STATE AID

From the incomplete data reported, the extent of Federal and State aid to city health departments can be estimated only in a general way. In many cases the exact amount is not stated in terms of money, such aid as is reported being given in the form of drugs as needed, free literature, advice or other assistance from Federal and State officials, or money appropriation for the whole State, not segregated for individual cities.

Under the Chamberlain-Kahn Act, Federal funds are allotted on the basis of population to State departments of health for use in

¹² See Chapter on health department expenditures, this survey.

the prevention, control, and treatment of venereal diseases. These funds are expended by the State for the benefit of the State in general and for certain cities specifically, or in a few instances given by the State to the cities for expenditure. This being the case, it is usually impossible to segregate Federal and State aid. Only occasionally can a definite sum of money given to a city be traced, via the State health department, to the Federal Treasury. The data as to Federal aid furnished by the health departments should be interpreted in the light of these facts, as not all cities report indirect Federal aid.

It can be said, however, that 25 cities report some form of Federal aid, that 59 cities report that they have no such aid, while 15 cities¹³ make no report. Only eight cities report a definite sum in money as their proportion of the State allotment from Federal funds, as follows: Boston, \$313; Birmingham, \$800; Providence, \$572; Richmond, \$225; Evansville, \$1,200; Lawrence, \$78; Manchester, \$100; and South Bend, \$1,200. Seventeen cities¹⁴ report Federal aid in the form of free literature, drugs, or unspecified funds through the State.

Sixty-nine cities report assistance from the State; 24, that no such aid is received; while 6 cities¹⁵ furnish no information as to this item. Washington, D. C., is excepted in the analysis.

Thirty-three cities report financial aid from the State to be expended for drugs, salaries, equipment, clinical maintenance, or other purposes, as shown by Table II.

TABLE II.—*Financial aid from the State to thirty-three cities*

Population group	City	Amount	Population group	City	Amount
500,000 and over-----	Boston-----	\$12,700	100,000 to 250,000— continued.	Salt Lake City----	\$600
	Chicago-----	12,600		Spokane-----	400
	Detroit-----	1,800		Springfield-----	1,000
250,000 to 500,000-----	Denver-----	4,800	70,000 to 100,000-----	Syracuse-----	3,000
	Louisville-----	2,419		Trenton-----	150
100,000 to 250,000-----	Birmingham-----	6,120		Worcester-----	1,000
	Dallas-----	1,500		Allentown-----	175
	Elizabeth-----	2,000		El Paso-----	2,250
	Fall River-----	1,000		Evansville-----	1,200
	Flint-----	1,350		Fort Wayne-----	2,400
	Lowell-----	1,447		Lawrence-----	922
	Lynn-----	1,000		Manchester-----	2,007
	New Bedford-----	1,000		Peoria-----	1,200
	Oklahoma City-----	1,140		Schenectady-----	300
	Providence-----	7,500		Somerville-----	1,000
	Reading-----	1,320		South Bend-----	1,200
	Richmond-----	225			

In addition to the sum of money reported above, Chicago receives from the State salvarsan and the services of six clinicians; Oklahoma City, medical supplies and personnel; Richmond and Lawrence,

¹³ 6, 7; 23; 30, 36, 39, 41, 42, 50, 67, 69, 74; 79, 82, 97.

¹⁴ 5; 15, 16, 21, 26; 29, 38, 58, 64, 68, 75; 84, 90, 92, 94, 95, 100.

¹⁵ 7; 16; 39, 74, 78; 86.

arsphenamine. The report of Denver mentions the presence in that city of the State Detention Home for Women.

Thirty-six cities¹⁶ report drugs, equipment, personnel, or other form of clinical maintenance, the cost of which is not specified.

It should be noted that the sums of money reported as State aid in Denver, Des Moines, and Reading are for the maintenance of State clinics, and that in the group of 35 cities reporting various kinds of aid without stating money equivalent, Baltimore, Philadelphia, Minneapolis, Scranton, Wilmington, and Wilkes-Barre report State maintenance of clinics.

Twenty-four¹⁷ cities report neither Federal nor State aid.

NONOFFICIAL AGENCIES

Forty-six cities report nonofficial agencies more or less actively interested in some form of venereal disease control; 48 no such agencies; 6 cities¹⁸ no report.

In 30 cities¹⁹ nonofficial agencies are said to cooperate with official agencies; in 7²⁰ there is no cooperation. Nine cities²¹ make no statement as to the relationship between official and nonofficial groups. It is interesting to note the wide variety of social service organizations which are stated to be supporting the venereal disease program.

Eighteen cities²² make particular note of service rendered by hospitals or dispensaries. Twenty-four cities report a wide range of interested bodies. Among such reported in Chicago are the Illinois Social Hygiene League, the General Medical Foundation, the Public Health Institute, and the Pullman and Western Electric companies; also private laboratories. Cincinnati, Tacoma, Portland, and Hartford report a local social hygiene society. Paterson has a social hygiene committee; Kansas City, Mo., a social hygiene committee of the Health Conservation Association. A children's aid society in Buffalo and a children's welfare association in Louisville are furthering activities for the control of venereal disease. The Women's Cooperative Alliance and Hennepin County Law Enforcement Association are reported by Minneapolis. Toledo reports a vice commission; Erie, a committee of 16. Visiting nurses' associations are mentioned by New Haven, Omaha, and Sioux City.

¹⁶ 1, 5, 9; 13, 14, 18, 20, 21, 22, 23, 24, 26; 29, 30, 33, 34, 37, 38, 41, 45, 46, 47, 49, 55, 64, 67, 75, 77; 81, 90, 92, 94, 97, 98, 99, 100.

¹⁷ 3, 8, 10, 11, 12; 17, 25, 27; 31, 35, 44, 48, 52, 53, 56, 57, 59, 60, 66, 71, 73; 80, 85, 91.

¹⁸ 30, 74; 84, 85, 93, 97.

¹⁹ 2, 3, 4, 6, 7, 8 (New York reports that there are about 30 clinics associated with hospitals scattered throughout the city, these being nominally under the Department of Health and supervised according to regulations); 13, 16, 18, 22, 23, 25, 27, 28; 39, 41, 50, 55, 57, 59, 62, 64, 70, 71; 81, 88, 94, 100.

²⁰ 1, 5; 46, 52, 53, 78; 90.

²¹ 19, 24; 35, 36, 54, 60, 61, 63, 74.

²² 1, 2, 4, 5, 7, 8; 21, 23, 25; 35, 53, 55, 63, 64, 70, 78; 81, 94.

Dallas reports a girls' protective home; Duluth, a Corpus Christi House and Bethel Maternity Home; St. Joseph, a Red Cross chapter; Lowell, Lowell Guild and other social agencies; Oakland, a health center. Providence reports that "women's organizations are active in educational work and law enforcement."

NOTIFICATION

An essential measure for the control of the venereal diseases is the passing of laws making them reportable as are the other dangerous contagious diseases. The only cities stating that the venereal diseases are not reportable are Salt Lake City, Utah,²³ and Washington, D. C.²⁴ Pennsylvania has an enabling act which gives the State board of health power to make regulations regarding venereal diseases. Reporting of these diseases has not been made compulsory by the board. There exists, however, a ruling made by the advisory board to the State health department to the effect that persons defined as public health menaces may be quarantined. There is, in addition, another measure giving to physicians discretionary power as to reporting. In addition to State laws relating to notification, 43 cities²⁵ report municipal ordinances repeating or supplementing State provisions, 42 state that they do not have municipal ordinances, and 15²⁶ do not report. Of the 98 cities with reporting laws, 36²⁷ require the name and address to be given in the first report, and 57²⁸ give an office number. Of the latter group, however, 22²⁹ state that they require a second report giving name and address, if the patient fails to continue treatment.³⁰ New York reports, "Notification is not obligatory"; Scranton, Tulsa, and Wilkes-Barre, "Notification is not in practice." Pittsburgh does not report as to notification.

²³ Reporting of the venereal diseases is made compulsory under chapter 52 of the Utah Laws of 1919. The State board of health under authority of this chapter has enacted rules and regulations providing that reports shall be made by number, except in cases where the patient refuses to receive proper treatment or to observe precautionary measures, when such report shall be by name.

²⁴ In 1925 Congress passed a law providing for complete venereal-disease control in the District of Columbia.

²⁵ 4, 5, 6, 8 (New York City provides for direct reporting. In New York State, however, reporting is indirect; that is, specimens which are sent to State laboratories for examination must be accompanied by the name and address of patient), 9, 11, 12; 13, 14, 15, 17, 18, 19, 22, 25, 26; 30, 37, 39, 41, 42, 49, 52, 53, 56, 59, 60, 61, 66, 68, 70, 71, 77, 78; 79, 80, 84, 86, 89, 90, 92, 96, 99.

²⁶ 1, 7, 10; 16; 32, 45, 48, 54, 55, 72, 75; 83, 93, 95, 97.

²⁷ 1, 3, 5, 6; 13, 14, 16, 17, 22, 25, 27; 29, 30, 35, 37, 39, 40, 43, 45, 60, 61, 62, 70, 72, 74, 77, 78; 79, 80, 81, 83, 84, 85, 88, 93, 97.

²⁸ 2, 4, 7, 9, 11, 12; 15, 18, 19, 20, 21, 23, 24, 26; 31, 32, 33, 34, 36, 38, 41, 42, 44, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 63, 64, 66, 68, 69, 71, 75, 76; 82, 86, 87, 89, 90, 91, 92, 94, 95, 96, 98, 99.

²⁹ 2, 7; 19, 21; 34, 42, 44, 47, 48, 50, 52, 53, 54, 59, 63, 64, 69, 75; 86, 87, 90, 92.

³⁰ Minneapolis reports that about 20 per cent of cases reported were "first report" cases, reported by office number, while 80 per cent were delinquent and reported by name and address. Savannah reports that 95 per cent were reported by name and address; also that food handlers, barbers, and manicurists must be reported in this way.

Thus in 57 cities, or in the majority of the 100 cities studied, privacy is insured by law to infected persons who take the necessary steps to be cured of their infections.

Differences in the procedure of reporting are worthy of note. Some differences are due to State and municipal legal requirements and some to local custom in practice. In 50 cities physicians report to the city health department only; in 21 cities to the State health department only; in 24, to both city and State health departments. In 7 cities, in which the first report is made to the city health department by the physician, the local department makes another notification to the State. In the Tennessee cities, notification is made first to the State, and by the State to the local department.

Thirty-nine cities³¹ report that probable sources of infection are customarily reported to the local health department; 26,³² that the information is "occasionally," "frequently," or "sometimes" given; and 31, that there is no such report. Of this latter group, however, Milwaukee, Minneapolis, Bayonne, Camden, Grand Rapids and Trenton make such a report to the State, with consequent action by that agency. Pittsburgh and Scranton have furnished no data as to this point.

Information was obtained from 64 cities as to the follow-up of reports on sources of infection. Almost three-fourths, or 46 cities,³³ customarily utilized the information in an effort to prevent further transmission of infection; 15 cities³⁴ "occasionally" or "sometimes" did. Kansas City (Mo.), Dallas, and Fort Worth state that they do not follow up such information. Utica furnishes no data.

The survey included certain questions as to the detail of information required by various cities to be recorded on notification cards. It is obvious, of course, that such cards in order to have a value to the epidemiologist, must include certain basic items. It was found that about 65 cities³⁵ distinguish between chronic and new attacks of gonorrhea. Twenty-eight cities do not report new and old attacks, while Chicago, Cambridge, and Evansville give no information as to this point. Thirty-four³⁶ require information on each case card as to the number of previous attacks of gonorrhea, 58 do not;

³¹ 2, 3, 4, 6, 7, 9, 11, 12; 14, 15, 16, 17, 18, 22, 24, 25; 29, 33, 39, 40, 43, 44, 46, 50, 55, 59, 61, 64, 71, 74, 75; 79, 81, 84, 88, 91, 94, 98, 99.

³² 1, 5, 8; 26; 30, 32, 36, 37, 38, 41, 48, 49, 52, 53, 57, 60, 62, 68, 70, 77; 85, 89, 92, 93, 97, 100.

³³ 1, 2, 3, 4, 6, 7, 8, 9, 11, 12; 16, 17, 22, 24, 25, 26; 29, 30, 37, 38, 39, 40, 41, 43, 46, 48, 50, 52, 53, 57, 59, 60, 61, 64, 68, 71, 75; 81, 84, 85, 88, 93, 94, 98, 99, 100.

³⁴ 5; 14, 15; 32, 33, 49, 55, 62, 70, 77; 79, 89, 91, 92, 97.

³⁵ 3, 5, 8, 11, 12; 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26; 29, 30, 32, 33, 35, 36, 38, 39, 40, 43, 44, 45, 46, 47, 48, 49, 50, 52, 53, 55, 56, 59, 60, 61, 62, 63, 68, 70, 71, 72, 74, 75, 77; 79, 80, 82, 84, 86, 87, 89, 90, 91, 92, 93, 94, 97, 98, 99.

³⁶ 3, 8, 11, 12; 15, 16, 25; 30, 36, 40, 43, 44, 47, 49, 50, 59, 60, 62, 66, 70, 74, 75, 77; 79, 80, 82, 87, 88, 89, 92, 93, 94, 97, 99.

Cambridge and Evansville have furnished no data on the point. Detail as to recurrent syphilis is said to be recorded by 30 cities.³⁷ Fifty-nine do not record it, while New York, Cambridge, Utica, Canton, and Peoria do not answer the question. Fifteen cities³⁸ request information on case cards as to previous use of chemical prophylaxis; 78 cities do not. Cambridge has not replied.

In some cities measures have been taken to insure that other than venereal clinics will look for and report manifestations of syphilis. In 34 cities³⁹ it is stated that nonvenereal clinics report neuro-syphilis or late manifestations; in 59, that they do not make a practice of reporting such discoveries. Seven cities⁴⁰ give no data concerning such reporting.

Forty-four cities⁴¹ are of the opinion that there has been an increase in the number of physicians reporting cases of venereal disease. The probable causes named are three or four in the main; (1), city, State, and Federal activities to educate the profession to the importance of notification; (2), generally increased interest in reporting; (3), greater use of city clinics and laboratories; and (4), better enforcement of reporting laws. One city, Portland, states that two physicians were arrested for not reporting.

A decrease in the number of physicians reporting is given by 16 cities.⁴² The probable causes of decrease stated are: (1) Lack of interest or carelessness on the part of the physician; (2) lack of law enforcement; (3) antagonism toward the laws requiring reporting; (4) physicians are not cognizant of the value of the reports; (5) physicians feel that inadequate use is made of the data thus reported; and (6) venereal-disease control is considered a war measure, and there has been a reaction from the drives made in war time.

Seventeen cities⁴³ report "stationary," "no change," or "about the same," as to the number of physicians reporting. One city, Reading, states that the number of physicians reporting is "variable." Wilkes-Barre states that "physicians do not now report at all, as they are not urged to by the city health department, and they recently decided it was poor practice to do so."

³⁷ 3, 11, 12; 15, 16, 17, 25; 29, 30, 40, 44, 45, 47, 49, 50, 59, 60, 70, 71, 72, 75, 77; 79, 82, 87, 90, 92, 93, 97, 99.

³⁸ 11, 12; 15; 29, 36, 40, 43, 44, 47, 49, 59, 62, 74; 79, 84, 94.

³⁹ 4, 6, 7, 8; 15, 16, 21, 22, 25, 26, 27; 30, 37, 38, 39, 40, 43, 48, 49, 52, 59, 69, 70, 74, 77; 80, 82, 84, 86, 89, 93, 94, 97, 99.

⁴⁰ 1, 10; 34, 64, 67, 73; 83.

⁴¹ 1, 3, 4, 5, 7, 11; 14, 17, 21, 22, 24, 25, 26; 30, 35, 40, 42, 43, 45, 46, 49, 52, 53, 55, 60, 61, 64, 68, 69, 71, 74, 77; 80, 81, 82, 86, 89, 91, 92, 94, 95, 97, 98, 99.

⁴² 9, 12; 27; 32, 37, 41, 44, 54, 56, 58, 59, 66, 76; 84, 85, 93.

⁴³ 8; 13, 15, 18, 20, 23; 29, 33, 36, 38, 39, 48, 57, 63, 78; 88, 90.

Nineteen cities ⁴⁴ give no information concerning the number of physicians reporting in 1923 as compared with the number reporting previous to that year.

VENEREAL MORBIDITY

An increasing number of cities were able to furnish venereal morbidity data during the five-year period from 1919 to 1923. A total of 54 reported for 1919, while in 1923 fairly complete information as to reported cases was obtained from 72 cities. This increase undoubtedly denotes an improvement in record keeping in recent years. The rates as quoted in Table III, however, do not represent in any degree a true picture of the incidence of venereal disease in these cities for several reasons. Examination of figures from a few individual cities reveals the fact that a large proportion of the cases reported are clinic cases, with the assumption, therefore, that physicians have not cooperated to the fullest extent in reporting cases. It is a generally known fact that many physicians are unwilling to report cases of venereal disease. It should also be pointed out that gonorrhea is less frequently reported than syphilis, although it is believed to be three to four times as prevalent. In all five years for which data were obtained the rate per 100,000 population for gonorrhea is smaller than the same rate for syphilis. Taking into account these large allowances for error it is obviously unsafe to base any conclusion as to prevalence or trend on the rates quoted in Table III. The most noteworthy point is the similarity of the 1919 and 1923 rates for all classes. When the rates per 100,000 population for these years are compared only differences ranging from 2 to 8 cases in different disease groups are found. In view of the fact that 56 per cent of the cities report an increase in the number of physicians reporting this similarity may be indicative of a tendency toward a decrease in incidence. Either a greater number of physicians report a fewer number of cases through carelessness, or they have fewer cases to report. As for the clinics whose reports contribute largely to the total of cases included in the rates, records show that they have increased in number and in volume of service since 1919.

Rates per 100,000 for all cities, and for the four main groups of cities separated for all venereal diseases, syphilis, gonorrhea, and other venereal diseases (which latter heading may be assumed to mean chancroid) are given in Table III.

⁴⁴ 2, 6, 10; 16, 19; 31, 34, 47, 50, 51, 67, 70, 72, 73, 75; 79, 83, 87, 96.

TABLE III.—*Number of cases of venereal diseases per 100,000 population reported from 1919 to 1923*

Cities of population of—	1919		1920		1921		1922		1923	
	Num- ber re- port- ing	Rate per 100,000	Num- ber re- port- ing	Rate per 100,000	Num- ber re- port- ing	Rate per 100,000	Num- ber re- port- ing	Rate per 100,000	Num- ber re- port- ing	Rate per 100,000
All venereal diseases:										
500,000 and over.....	9	428.7	10	407.8	11	392.9	11	411.8	11	454.1
250,000 to 500,000....	5	445.7	7	320.7	10	370.8	11	518.0	11	500.2
100,000 to 250,000....	28	611.8	31	598.7	33	492.3	36	482.0	35	459.2
70,000 to 100,000....	12	226.1	13	286.6	15	350.0	16	385.3	15	446.0
Total.....	54	453.3	61	426.3	69	405.3	74	439.0	72	461.3
Syphilis:										
500,000 and over.....	9	243.0	10	235.2	11	206.7	11	205.5	11	232.4
250,000 to 500,000....	5	197.5	7	125.6	10	176.9	11	246.4	11	228.9
100,000 to 250,000....	28	270.2	31	278.5	33	243.7	36	241.3	35	230.6
70,000 to 100,000....	12	95.2	13	129.0	15	181.3	15	213.2	15	262.7
Total.....	54	236.8	61	225.5	69	207.9	73	218.6	72	233.0
Gonorrhea:										
500,000 and over.....	9	178.4	10	164.8	11	180.4	11	196.4	11	207.5
250,000 to 500,000....	5	221.7	7	172.6	10	176.5	11	256.3	11	256.1
100,000 to 250,000....	28	320.4	31	301.9	33	235.1	36	224.0	35	209.5
70,000 to 100,000....	12	128.7	13	154.5	15	164.7	16	167.9	15	177.3
Total.....	54	205.2	61	189.6	69	188.7	74	208.7	72	213.4
Other venereal diseases:										
500,000 and over.....	7	13.5	8	13.7	8	11.0	9	16.6	9	23.6
250,000 to 500,000....	3	44.8	4	39.0	7	22.7	8	19.5	8	19.5
100,000 to 250,000....	13	45.2	13	44.0	13	34.7	18	30.7	21	29.7
70,000 to 100,000....	7	3.8	7	5.7	9	6.5	8	8.4	8	11.8
Total.....	30	21.0	32	20.4	37	15.9	43	19.2	46	23.6

PROPHYLACTIC AND PREVENTIVE MEASURES

ISOLATION AND QUARANTINE

Satisfactory notification of venereal disease cases does not insure that all infected persons will take treatment or observe proper precautions against spreading disease. It has, therefore, been deemed advisable in most States not only to provide treatment facilities, but also to pass specific laws permitting compulsory isolation and quarantine of persons who refuse treatment. With the exception of the 10 cities in Massachusetts, all of the 100 cities surveyed are in States which have such laws. (The information reported with reference to city ordinances was too incomplete to permit of tabulation.)

Notwithstanding the almost uniform existence of State laws permitting or enforcing isolation, only 37 cities⁴⁵ state that isolation is regularly enforced. Eighteen others⁴⁶ report that they "rarely" or "sometimes" enforce isolation; 30 cities, that they do not enforce; and 5⁴⁷ give no information as to this point.

⁴⁵ 3, 4, 5, 6, 11, 12; 16, 17, 22, 23, 26, 27; 39, 41, 47, 49, 52, 55, 59, 60, 61, 62, 64, 66, 67, 71, 78; 79, 80, 82, 84, 88, 89, 91, 94, 96, 99.

⁴⁶ 7, 8, 9; 15, 21, 25; 29, 35, 36, 38, 56, 58, 63, 70; 81, 86, 92, 100.

⁴⁷ 10; 19, 20; 65, 68.

In 19 cities reporting some degree of enforcement cases are isolated in hospitals. Two of these, New Haven and Canton, state in general that cases which can not be isolated in the homes will be taken to detention hospitals for treatment. Twenty cities commit cases to be isolated in jails, reformatories, or detention homes. Nineteen fail to specify the place of detention. Of this group South Bend reports that isolation is enforced "by placarding only"; Norfolk, enforcement "if case is arrested for other causes." Savannah does not report as to the manner of isolation "in special cases" in 1923, but reports that beginning with February, 1924, "cases are to be isolated in quarters at barracks."

It is noteworthy that 11 cities—St. Louis, New York, Denver, Akron, Camden, Erie, Kansas City (Kans.), Paterson, Syracuse, Youngstown, and Canton—report detention for women but not for men.

Thirty-one cities report data concerning the number of cases isolated, as in Table IV.

TABLE IV.—*Number of cases isolated in 1923 by 31 cities.*

Number of cases ranging from—	Cities
1 to 10.....	New Orleans, Camden, Bayonne, Canton.
11 to 50.....	Kansas City, Kans., Memphis, Paterson, Tacoma, Fort Wayne.
51 to 100.....	Newark, Duluth, Reading, Wilkes-Barre, Peoria.
101 to 300.....	Buffalo, Detroit, San Francisco, Jersey City, Houston, Spokane, El Paso, San Diego, Wichita.
301 to 500.....	Los Angeles, Toledo, St. Paul.
501 to 800.....	Chicago, Cleveland, Akron, Richmond.
1,200.....	St. Louis.

Of the 10 Massachusetts cities, Fall River reports enforcement of isolation (in city hospitals); Boston, Lowell, Springfield, and Lawrence, enforcement of such measures "sometimes"; Springfield, that "probably 100 cases are given suspended sentence by the judge for as long as the doctor advises, the sentence being enforced when treatment lapses"; Cambridge, New Bedford, Worcester, and Somerville, that they do not enforce isolation, while Lynn does not reply.

CHEMICAL PROPHYLAXIS

Chemical prophylaxis is provided in 18 cities⁴⁸ and not provided in 75. Seven⁴⁹ do not furnish information as to this item. In 31 cities⁵⁰ chemical prophylaxis is advocated; in 45, not advocated. Dayton is "neutral" on this point. Twenty-three cities⁵¹ do not state their position in this matter. Thirty-four cities have reported

⁴⁸ 3; 21, 22; 35, 36, 44, 47, 49, 58, 62, 66, 75; 80, 82, 84, 89, 92, 94, 100.

⁴⁹ 10; 19; 51, 65, 78; 83, 95.

⁵⁰ 3, 4, 5, 11, 12; 13, 26; 29, 36, 41, 44, 47, 49, 52, 53, 57, 58, 61, 62, 66, 68, 75; 79, 80, 81, 82, 84, 89, 91, 92, 100.

⁵¹ 1, 10; 14, 19, 22, 28; 35, 38, 40, 45, 51, 60, 65, 67, 71, 73, 74, 76, 77, 78; 83, 95, 98.

as to the probable effect of chemical prophylaxis on incidence. One city reports, "it is claimed that incidence is reduced, but this questionable." Twelve cities report, "No effect," or "practically none"; 2 cities, "slight" effect; 10, that the effect is not known.

DIAGNOSTIC FACILITIES

Information in regard to diagnostic facilities is meager and in many cases ambiguous, thus making impossible satisfactory classifications or certainty as to findings.

Such facilities are reported in the case of 95 cities. Pittsburgh, Louisville, Lynn, Somerville and Allentown give no data on this point.

Thirty-six cities⁵² definitely report diagnostic facilities at the "Health department laboratory," "Central laboratory," "Public Health laboratory," or "City laboratory." Twenty others note diagnostic facilities at clinics. The remaining cities have diagnostic facilities variously in State, contract, private, and hospital laboratories.

Of the 95 cities reporting such facilities, 81 report Wassermann tests for syphilis. In 21 of these, facilities for such tests are noted as provided by the State.

The total number of Wassermanns performed in 1923 were furnished by 56 cities, as in Table V.

Dark field examinations for syphilis are reported by 42 of the 95 cities. In 19 others it is reported that no dark fields were made. Of the 42 cities utilizing this method, 21⁵³ report dark field examinations ranging from 1 to 50; 11 cities,⁵⁴ from 50 to 400. Detroit reports the large number of 3,047. Little information was reported under examinations for syphilis other than Wassermanns and dark fields. A few colloidal gold diagnoses were reported, and some spinal fluid tests.

Smears for gonorrhea are reported by 79 cities, this number including some which customarily utilize State laboratory service. Sixty-eight reported the total number of examinations by this method as in Table VI.

Complement fixation tests are reported by 9 cities. Of these, total figures are furnished by Chicago with 8,759; Jersey City, 5,637; Lowell, 73; Fort Wayne, 4; Lawrence, 233; and Manchester, 8. No figures are given by the other 3 cities—Cambridge, Norfolk, and Springfield—which make such tests. A few other cities report that such facilities are provided by the State.

⁵² 1, 2, 4, 5; 15, 20, 22, 23, 27, 28; 31, 32, 34, 36, 37, 43, 46, 47, 52, 55, 56, 57, 58, 64, 65, 66, 69, 74, 77; 85, 86, 87, 89, 90, 91, 97.

⁵³ 1, 5; 17, 25; 30, 39, 43, 50, 53, 61, 64, 68, 70, 74, 77; 80, 87, 90, 92, 96, 97.

⁵⁴ 2, 4, 8, 12; 20, 22; 29, 35; 84, 86, 94.

TABLE V.—*Number of Wassermanns reported in 56 cities in 1923*

Cities reporting population of—	Under 100 Wassermanns	100 to 1,000	1,000 to 5,000	5,000 to 10,000	10,000 to 20,000	Over 20,000
500,000 and over.		San Francisco.	St. Louis.	Buffalo.	Cleveland.	Chicago. Boston.
250,000 to 500,000.			Baltimore. Cincinnati. Columbus. Denver. Jersey City. Milwaukee. New Orleans. Portland.	Seattle.	Detroit. Kansas City, Mo. Newark. Rochester.	
100,000 to 250,000.	Dayton. Tacoma.	Dallas. Duluth. Lowell. Reading. St. Paul. Salt Lake City. Spokane. Yonkers.	Akron. Albany. Bridgeport. Camden. Houston. Nashville. San Antonio. Utica. Worcester.	Norfolk. Richmond. Syracuse.	Birmingham. Memphis. Providence.	
70,000 to 100,000.		Bayonne. Manchester. St. Joseph. Schenectady.	El Paso. Fort Wayne. Knoxville. Savannah. Sioux City. South Bend. Troy. Wichita.			
Total.	2	13	26	5	8	2

TABLE VI.—*Number of smears reported in 68 cities in 1923*

Cities reporting population of—	Under 100 smears	100 to 1,000	1,000 to 5,000	5,000 to 10,000	10,000 to 20,000	Over 20,000
500,000 and over.		San Francisco.	Baltimore.	St. Louis.	Boston.	Chicago.
250,000 to 500,000.			Buffalo. Cleveland. New York. Columbus.		Detroit. Los Angeles.	
100,000 to 250,000.	Dayton. Kansas City, Kans. Trenton.	Cincinnati. Denver. Milwaukee. New Orleans. Rochester. Atlanta. Bridgeport. Camden. Dallas. Duluth. Hartford. Lowell. Memphis. Oakland. Reading. Richmond. Salt Lake City. Spokane. Tacoma. Utica. Worcester.	Jersey City. Kansas City, Mo. Newark. Portland. Akron. Albany. Birmingham. Flint. Nashville. Norfolk. Providence. St. Paul. Syracuse. Yonkers.	Seattle. Houston. San Antonio.		
70,000 to 100,000.	Lawrence. Waterbury.	Bayonne. Canton. El Paso. Manchester. St. Joseph. San Diego. Savannah. Schenectady. Sioux City. South Bend. Troy. Wichita.	Fort Wayne. Knoxville.			
Total.	5	34	21	4	3	1

DETECTION OF DANGEROUS CARRIERS

In certain types of occupations, the employment of persons having venereal disease infections offers serious menace to public welfare. Among workers whose infections are likely to be dangerous may be mentioned food handlers, barbers, masseurs, beauty parlor operators, and dancing instructors. Provisions regulating employment of workers of all these classes are in force in several cities. The question on this specific subject of the investigation reads, "Examination of food handlers, barbers, etc."

Physical examination of some or all of the "danger classes" are reported by 52 cities, in 37⁵⁵ as routine procedure, and in 15,⁵⁶ "sometimes" or "on suspicion."

Forty cities report that no such precautionary examinations are made. Birmingham states that an ordinance "has been passed and will be in force in a few months," and Camden that there is "a State law not enforced." No information is furnished by 6 cities.⁵⁷

Material as to the number of infections detected is extremely meager. Of the 52 cities reporting physical examinations of "food handlers, barbers, etc.," as routine procedure or "sometimes, or on suspicion," exact figures regarding the number of venereal disease cases reported are given by only 17, as follows: Buffalo reports 39 cases of venereal disease detected (37 syphilis and 2 gonorrhea); Detroit, 131 cases; Newark, 10; Portland, 97; Seattle, 23; Dayton, 24 (1 syphilis, 23 gonorrhea); Duluth, 110; Erie, 19; Flint, 200; Houston, 9; Kansas City (Kans.), 150; Oakland, 12; Spokane, 39; Fort Wayne, 70; Sioux City, 1,000; Waterbury, 14. El Paso reports 238 cases for part of the year 1923. Cleveland, Philadelphia, Columbus, Cambridge, Oklahoma City, and Savannah report in terms of "a few" or "a small number" of cases. The remaining 22 cities⁵⁸ do not state the result of their examinations.

TREATMENT

VENEREAL-DISEASE CLINICS

All of the 100 cities included in the survey had one or more venereal-disease clinics maintained by the city, State, or other agencies in 1923. Although Pittsburgh makes no report in regard to clinics, it should be listed among the cities providing such service.

⁵⁵ 3, 5, 6, 8, 9; 14, 16, 17, 18, 22, 24, 26; 34, 36, 37, 40, 41, 43, 47, 49, 56, 58, 60, 62, 66, 67, 68, 71, 74; 79, 82, 84, 85, 86, 96, 98, 100.

⁵⁶ 2, 12; 20, 25; 38, 39, 44, 55, 57, 59, 63, 77; 88, 92, 94.

⁵⁷ 10; 19, 23; 51, 61, 78.

⁵⁸ 2, 8; 16, 18, 20, 25; 36, 38, 40, 44, 55, 56, 59, 62, 66, 71, 74, 77; 79, 86, 88, 99.

As nearly as could be ascertained from available data, 72 cities⁵⁹ in 1923 apparently had clinics wholly or partly maintained by city health department funds, and 5 cities—Denver, Louisville, Minneapolis, Fort Worth, and Oakland—report that cases of venereal diseases in the city jails are treated by the city health departments.

Reports from 11 cities—Boston, Buffalo, Cleveland, Louisville, Bridgeport, Cambridge, Des Moines, St. Paul, Worcester, Bayonne, and Harrisburg—indicate the existence of clinics supported at least in some degree by city funds although not by the city health department. Support by the county is noted by 7—Milwaukee, Fort Worth, Oakland, Salt Lake City, El Paso, Tulsa, and Sioux City.

While details of maintenance are not called for by the questionnaire and complete information on this subject can not therefore be given, it may be said that 69 cities report aid by the State. State clinics are definitely noted in the case of 16 cities.⁶⁰ One city, Manchester, has a clinic operated jointly by the city and State. State aid given to the other 52 cities, when specified, is given in the form of money or "salaries," drugs, supplies, and equipment or personnel, some details concerning which are found in the section on Federal and State aid.

Clinics maintained, at least in part, by private agencies are noted by 14 cities.⁶¹ In the case of 27 cities,⁶² clinics are also maintained in hospitals or dispensaries whose nature is not specified, while one city, Somerville, notes a clinic but with no additional information other than that the State contributes "\$1,000 toward clinic."

Some figures have been obtained of the number of cases of venereal diseases treated in clinics. The rate per 100,000 for all venereal-disease cases thus treated in 1923 is 349.2. Details are shown in Table VII following:

TABLE VII.—*Rate per 100,000 population of cases of venereal diseases treated in clinics in 1923*

Cities with population of—	Total venereal diseases		Syphilis		Gonorrhea		Other cases	
	Number of cities reporting	Rate per 100,000 population	Number of cities reporting	Rate per 100,000 population	Number of cities reporting	Rate per 100,000 population	Number of cities reporting	Rate per 100,000 population
500,000 and over.....	10	222.3	10	125.9	10	86.1	7	19.1
250,000 to 500,000.....	7	262.5	7	145.2	7	117.1	3	.7
100,000 to 250,000.....	35	696.4	35	428.0	35	236.6	23	46.9
70,000 to 100,000.....	16	742.8	16	438.2	16	286.2	14	20.8
Total.....	68	349.2	68	205.1	68	130.3	47	24.4

⁵⁹ 1, 4, 5, 6, 7, 8, 9, 10, 11, 12; 13, 14, 16, 17, 18, 20, 22, 23, 24, 25, 26, 27, 28; 29, 32, 36, 37, 39, 40, 43, 45, 46, 47, 48, 49, 50, 53, 54, 55, 56, 58, 59, 60, 63, 64, 65, 66, 68, 69, 70, 71, 72, 73, 74, 75, 77; 79, 82, 83, 84, 86, 87, 88, 89, 91, 92, 93, 96, 97, 98, 99, 100.

⁶⁰ 1, 9; 14, 15, 21, 24; 41, 51, 58, 62, 67, 69, 75, 76; 79, 100.

⁶¹ 1, 5, 12; 18, 23; 30, 35, 36, 70; 81, 94, 97, 99, 100.

⁶² 1, 2, 3, 5, 8, 9; 13, 19, 20, 21, 25; 30, 31, 34, 40, 49, 51, 52, 53, 55, 60, 61, 64, 78; 79, 80, 91.

Little information was obtained in regard to the item "cases of syphilis sterilized," the question apparently not having been understood in the large majority of cases. Two cities—Los Angeles and Lowell—report under 100 cases of syphilis sterilized; four cities—Milwaukee, Lynn, Scranton, and Savannah—from 100 to 300 cases. From 300 to 700 cases are reported by six cities—Chicago, St. Louis, Houston, Memphis, Nashville, and Fort Wayne; and Providence reports 972 cases. Dallas reports 117 cases sterilized in six months; Wilkes-Barre, that "all" cases are sterilized; and Camden, "all eventually." New Haven reports 18 discharged cured; Trenton, 37; Schenectady, 47; South Bend, 61; Lawrence, 14; and Evansville, 68. Thirteen cities⁶³ state that syphilitic cases are not sterilized, while 65 cities give no information concerning this item.

Clinic equipment for accurate diagnosis is reported by 84 cities. Six cities—Baltimore, Seattle, Houston, Lynn, Tacoma, and Canton—report no such equipment. Ten cities—Pittsburgh, Denver, Indianapolis, New Orleans, Erie, Fall River, New Bedford, Norfolk, Tulsa, and Harrisburg—fail to report on this point.

Ninety cities state that clinics are equipped for adequate treatment. Canton reports negatively on this point, and nine cities—Pittsburgh, Denver, Indianapolis, Erie, New Bedford, Norfolk, Tacoma, Tulsa, and Harrisburg—give no information.

HOSPITALS

Treatment in hospitals in greater or less degree is available in more than three-fourths or 79 of the cities covered by the survey. Reports from 16⁶⁴ seem to indicate no such provision. Of this group, however, certain ones are worthy of particular mention. Atlanta and Tulsa have no hospitals regularly available, but treat cases of venereal disease in patients admitted for other causes. No hospital in Kansas City (Kans.) admits venereal-disease patients. One hospital, however, operates an out-patient department handling about 100 cases, particularly late syphilis. Youngstown also reports home treatment for venereal diseases. Pittsburgh, Erie, New Bedford, Wilmington, and Troy do not report as to hospital treatment.

It is obvious that full information has not been given in many cities as to the number and type of hospitals admitting venereal-disease cases. However, it is interesting to note that the city hospital is the one most frequently reported as providing such treatment. Thirty-eight cities⁶⁵ report city hospitals, so-called; six cities—Los Angeles, Portland, Salt Lake City, Yonkers, Manchester,

⁶³ 5; 14, 25, 27; 30, 41, 42, 43, 49, 65, 70, 78; 81.

⁶⁴ 29, 31, 32, 40, 44, 49, 51, 66, 71, 73, 78; 87, 89, 90, 95, 99.

⁶⁵ 3, 5, 7, 8, 9, 11, 12; 15, 16, 17, 18, 19, 21, 22, 25, 27, 28; 33, 34, 36, 38, 42, 45, 46, 47, 48, 55, 60, 64, 68, 70, 76; 80, 82, 83, 85, 93, 100.

Sioux City—county hospitals. Cambridge reports a State infirmary at Tewkesbury, "a glorified almshouse;" Flint, State hospital treatment for female gonorrheal cases and highly infectious syphilitics. Forty-two cities report hospitals which are listed as private or are unspecified as to ownership and management. A few others report facilities not easily classified in the groups already mentioned, such as city, county, or State prisons and detention homes.

Of the 79 cities reporting hospital service regularly or occasionally available, 34⁶⁶ have special beds set aside for venereal-disease patients. Twenty-two⁶⁷ provide beds but do not segregate them from the beds for other patients. Twenty-three cities do not report as to provision of beds.

Specific information as to the number of beds available was given in only a few cases. Thirty-two cities report a total of 2,221 beds available for all venereal diseases. Since, however, the figures do not include all classes of hospitals reported, total figures of beds available or of rates based upon population are not significant. A few figures are here quoted as suggestive of existing conditions. Buffalo reports 35 beds for syphilis, 35 for gonorrhea, and "as required" for other venereal infections. Chicago reports "ample service for complicated cases, but small capacity for ambulatory," and a total of 289 beds for syphilis and gonorrhea. Los Angeles reports a total of 70 beds in the Quarantine Hospital. The Philadelphia General Hospital has available for syphilitic patients 45 beds; for gonorrheal, 55; and for "other," 50. The total of 150 is said to include 30 beds for the especial use of children with gonorrheal vaginitis. San Francisco reports 45 beds available in the lock ward for women patients.

Information as to the number of cases treated in hospitals is given by only a few cities. Since the figures in various instances are incomplete, including cases treated in only one of several hospitals in which treatment is given, total figures of cases treated or of rates based upon population are not significant. A few figures, however, may be given as suggestive of existing conditions. It may be said that 29 cities report a total of 7,995 cases of venereal diseases treated in hospitals. Of these, 3,886 are cases of syphilis; 3,531 (in 27 cities), cases of gonorrhea; and 578 (in 9 cities) are cases of venereal diseases other than syphilis and gonorrhea.

NURSING SERVICE

The questionnaires show no uniformity in the reporting of nursing service. Reports from some cities include nurses in hospitals

⁶⁶ 3, 4, 5, 6, 7, 8, 9, 11, 12; 16, 17, 18, 20, 22, 24, 25, 26, 27; 33, 35, 45, 46, 56, 60, 62, 65, 68, 70; 80, 82, 88, 91, 92, 94.

⁶⁷ 2; 13, 14, 15; 36, 37, 39, 42, 43, 48, 50, 52, 55, 58, 77; 79, 84, 85, 86, 96, 98, 100.

and in venereal-disease clinics; from other cities, field service only for venereal-disease patients; from still others, both general and field service. Furthermore, definite lines have not been drawn between nursing service and social service.

In the analysis of data, hospital, and clinic nurses are considered as "general nursing service," and particular emphasis is placed on the nurses enumerated as giving out-patient service in venereal-disease cases. When a nurse has been reported under both nursing service and social service, she has been listed only in the group which seems logically to include her.

All of the cities included in the survey report general nursing service for venereal disease patients in either hospitals or clinics, or, in some cases, in both. Although Pittsburgh makes no report in regard to nursing service, it should be listed among the cities providing such service. It is possible that some of the nurses in this group occasionally give home treatment or do work of social service nature. They have not been listed as field nurses, however, unless home visits are definitely reported.

Thirty-three cities report one or more whole or part-time nurses doing field service, while 61 cities report that they have no such service. Buffalo, Cleveland, Pittsburgh, Des Moines, Providence, and Troy do not report regarding this item.

In the 33 cities field nurses are, with the exception of a few cases, provided by the city. Thus, in Group I, Chicago reports that 9 city clinic nurses do some social service work; Detroit, 1 nurse; Los Angeles, 4; New York, from 2 to 4. In Group III, Akron, Duluth, Grand Rapids, Oklahoma City, and Springfield report 1 field nurse each; Cambridge, Lowell, New Bedford, New Haven, Richmond, 2 field nurses; Nashville, 4. Camden reports that "all cases are followed up theoretically"; Oakland, that there is a nurse "detailed to this work, which consists of check on girls in so-called 'close dance halls' and return to treatment of those patients reported by clinics or physicians as not having conformed to State law." In addition to the special venereal-disease nurse reported by Akron, 37 general nurses are stated to be "always on watch for cases." Cambridge reports, in addition to 2 city field nurses, 5 sanitary inspectors who investigate males. Reading has 1 nurse employed by the State, and Scranton 3, who do some follow-up work. Elizabeth, Kansas City (Kans.), and New Haven report some venereal-disease cases handled by the visiting nurses' association, and Oklahoma City by the Public Health nursing bureau. In Group IV, Evansville, Lawrence, Manchester, San Diego, and Schenectady have 1 field nurse each, provided by city funds; Knoxville, 2. Canton and Wichita report service by the visiting nurses' association; Wilkes-Barre, from "unofficial organizations."

SOCIAL SERVICE

Social service in connection with venereal disease control is very closely related to the work of nurses. Over half, or 56 of the cities studied, however, report one or more workers provided by the city, the State, or by voluntary organizations, whose chief work is to follow up lapsed cases, and investigate home conditions. Thirty-seven cities report no social service, and 7⁶⁸ make no report regarding this point. Twenty-one cities⁶⁹ report one social worker provided by city funds, and in most cases from the health department budget; 5,⁷⁰ 2 or 3 workers; and one city, Bridgeport, 5. Lawrence reports that the policewoman follows up delinquent cases. Milwaukee and Wilkes-Barre report one worker provided by the State; Allentown, 2. Various charitable and civic organizations also furnish social service workers, either specifically for venereal disease control or for work of a general nature including work of this kind. St. Louis, Erie, and Richmond report one worker furnished by such agencies; Kansas City (Mo.), 2; Indianapolis, 2 to 3; Knoxville, 5. Buffalo, Cincinnati, Columbus, Youngstown, Canton, Fort Wayne, and Wilkes-Barre report that social-service work is done by voluntary organizations, but do not state the number of workers. Akron reports 26 workers from charity organizations doing work in the field of venereal disease.

A number of workers reported are not classified as to their connection with official or nonofficial agencies. One such worker occurs in the reports of San Francisco, Albany, Grand Rapids, St. Paul, Utica, Knoxville, and Troy; from 2 to 5 such workers, in the reports of Philadelphia, Jersey City, Minneapolis, Portland, and Nashville. Boston, Columbus, Des Moines, and Reading report workers in this group without giving the number.

METHOD OF MEDICATION

The information obtained as to the relative popularity of intravenous medication and intramuscular or subcutaneous medication seems to indicate the former the more acceptable to persons receiving treatment for venereal disease.

To the question as to whether intravenous medication tends to discourage treatment, 79 negative answers are given, 8 affirmative, and 2 cities report "possibly" or "sometimes." No opinion on this subject is given in the reports of 11 cities.

In reply to the question as to whether there is a tendency to more sustained treatment by intramuscular or subcutaneous medication,

⁶⁸ 8, 10; 19; 47, 61; 93, 94.

⁶⁹ 4, 6, 7, 12; 22; 36, 37, 39, 40, 43, 50, 52, 58, 59, 60, 70, 72, 77; 82, 83, 96.

⁷⁰ 1; 16, 18, 27; 80.

67 cities report in the negative, 8 in the affirmative, 5 "possibly" or "sometimes," while 20 cities do not report regarding this point.

QUACKS

Considerable interesting information is reported concerning the extent of practice of quacks. Thirty-six of the cities⁷¹ covered by the survey report the practice of quacks as not extensive by some such terms as "very few," "apparently some," or "to some extent." Seventeen cities⁷² indicate activities of this sort of considerable extent. Minneapolis has 4 or 5 "institutes" operating. Louisville reports "considerable treatment by druggists."

Twelve cities report on quacks in terms of numbers. Baltimore reports 6 quacks with large practices, who "report cases well." Sioux City has 6. In South Bend 3 such practitioners are reported as having "fairly extensive practice." In Dallas there is a "marked reduction" in these practitioners, although "3 or 4 are still at work." Lawrence reports "2 or 3 quacks, who do not do much business." Knoxville also reports 2. Columbus reports "1 advertising physician," and Birmingham 2 such; Camden, "1 known as such, not active in venereal-disease work." Jacksonville reports "4 offices," and "all reporting cases"; Canton, 2 offices, and Albany, "1 establishment." Six cities—Denver, Kansas City (Mo.), Bridgeport, Paterson, St. Joseph, and Wichita—report an "average" number of quacks; 6 cities—Boston, Buffalo, Cleveland, Des Moines, Grand Rapids, New Bedford—a "decreasing" or "diminishing" number; 4—Kansas City (Kans.), Elizabeth, Utica, and Manchester—"none." Six additional cities report as follows: St. Louis, "They were cleaned up a year ago, but coming back"; Cincinnati, "usually under cover"; Milwaukee, "largest institution recently closed by Milwaukee Health Department"; Rochester, "only in the medical profession." Reading and Allentown report that such practitioners are "forbidden by law," the "law" being "enforced" in the former case, and "probably well enforced" in the latter. Thirteen cities⁷³ make no report regarding this item.

NOSTRUMS

The question as to the sale of nostrums elicited a variety of answers. Twenty-six cities⁷⁴ report extensive use of nostrums; 16,⁷⁵ not extensive; 9,⁷⁶ "average"; 6,⁷⁷ "decreasing"; and 1 city, Jacksonville,

⁷¹ 4, 6, 8; 16, 17, 22, 23, 24, 27; 37, 42, 43, 46, 47, 50, 52, 53, 57, 58, 59, 61, 63, 64, 65, 68, 69, 70, 71, 77; 80, 82, 83, 84, 89, 98, 100.

⁷² 7, 11; 19, 21, 26; 29, 31, 39, 41, 44, 55, 56, 66, 75, 78; 91, 92.

⁷³ 9, 10; 28; 34, 51, 67, 72, 73, 76; 85, 93, 95, 97.

⁷⁴ 5, 7, 11, 12; 14, 22, 24; 29, 31, 39, 41, 46, 53, 55, 56, 58, 62, 63, 71, 72, 73, 78; 89, 92, 96, 98.

⁷⁵ 23, 25, 26; 40, 42, 43, 45, 47, 50, 59, 65, 69, 77; 80, 82, 99.

⁷⁶ 13, 15, 18; 33, 37, 49, 60, 63; 90.

⁷⁷ 2, 3, 4; 36, 54, 76.

“increasing.” Fort Worth, Jersey City, Louisville, Minneapolis (on prescription), and Schenectady report “nostrums sold”; Fort Wayne and Manchester, “no nostrums”; Detroit, “Drug stores give some trouble”; Indianapolis, “endeavoring to curb; State law prohibits sale”; Birmingham, that “law prohibiting sale is effective”; Camden, “such as are sold in drug stores, mostly for gonorrhea,” and “extent not exactly known”; Allentown, that the “State law is probably well enforced”; while Lawrence reports that an active campaign to abolish nostrums was “rather effective.”

Twenty-nine cities give no information regarding this item.

LEGAL AND PROTECTIVE MEASURES

Judging from the numerous ways in which the question, “Is anything done?” was answered, it was apparently not obvious to many of the persons reporting on this point what information was desired. Some cities report that the State laws or city ordinances are enforced, but without giving their provisions. Other cities report in terms of volume of accomplishment, as, for example, “considerable,” “some,” or “limited.” Still others give an indefinite answer, such as “police active,” “action where required.” Some cities, in reporting, have understood the question as limited to mean accomplishment, in the matter of control of sex offenders, by the health department alone, without reference to other city departments. Therefore, in analysis, the material has been taken simply as affirmative or negative. Lack of uniformity in the interpretation of this question is responsible for the discrepancies which are apparent when the totals of this section are compared with the totals of the section on arrest; that is, evidently some health officers have considered the matter of arrests as “something done,” while others have not.

Eighty cities report that something is done in the control of sex offenders; 15 cities⁷⁸ report little or no accomplishment. Five cities—Houston, Worcester, Yonkers, Youngstown, and Troy—do not report.

PROSTITUTION

The activities of the police and other agencies have been directed chiefly against houses of prostitution, whether in restricted areas or scattered, against solicitation on the streets, and toward supervision of dance halls and other places of amusement. While the presence of scattered houses of prostitution is generally admitted, in no city of the 97 which report on this item is there a recognized restricted area. Several cities, however, report conditions which very closely approach the point of restriction. Erie reports a “tolerated area”;

⁷⁸ 10; 28; 32, 44, 48, 51, 57, 58, 73, 75; 83, 85, 90, 91, 98.

Atlanta, "none theoretically; yes, actually"; San Antonio, "supposed not to be." Peoria reports that there is no definite area but "a tendency toward this plan," with now "probably 100 inmates." Savannah states that its restricted area was abolished in 1923. The three cities which do not report regarding the existence of a restricted area are Washington, Harrisburg, and Troy.

Two cities—Jersey City and Elizabeth—deny any existence of prostitution. Rochester reports, "no house of prostitution known to health department or police." Of the other 82 cities for which information is available, 17⁷⁹ report prostitution "extensive," or "widely spread." Ten cities⁸⁰ report prostitution fairly extensive or "moderate." Of these, Duluth reports "moderately large, due to number of tourists and foreigners," Erie, "average to plenty." Ten cities⁸¹ report prostitution as not extensive by some such comment as "limited," "commercial vice at low ebb." One of these, Somerville, states that "prostitution is slight, because of nearness to Boston." Ten cities⁸² report prostitution as "average," "about the same as in other cities of the same size." Of these, Norfolk reports conditions as "average for a seaport town," adding that while "visible conditions have enormously improved, real improvement seems doubtful." Six cities—New York, Indianapolis, Minneapolis, Portland, Worcester, and Wichita—report the extent of prostitution "less than average"; 6 cities—Detroit, Memphis, Spokane, Syracuse, Evansville, and South Bend—report that prostitution is "decreasing." One of these, Detroit, reports that the extent varies with police pressure; Memphis, that prostitution has been "markedly reduced in the last four years." Nine cities—Hartford, New Bedford, New Haven, Oakland, Providence, San Antonio, Canton, El Paso, and Manchester—specifically report prostitution as "clandestine." In 12 cities⁸³ the extent is "unknown" or "impossible to estimate." Two others—Fall River and Trenton—report "street walkers," Fall River further reporting, "no known houses." Fifteen cities⁸⁴ do not report.

Only 3 cities—Akron, Tacoma, and Paterson—report that the health department is taking any part in the campaign against vice. Erie reports accomplishment along these lines in the hands of the "Committee of Sixteen," with "casual control by the present administration." Peoria reports that a two-months' "clean-up" was instituted at the end of 1923 to examine all prostitutes and to place under treatment those infected. Three cities—Albany, Omaha, and

⁷⁹ 7, 11; 19, 22, 26, 27; 30, 31, 58, 60, 64, 67; 86, 87, 91, 93, 94.

⁸⁰ 3, 4, 12; 39, 41, 47, 59, 65, 71; 92.

⁸¹ 5; 43, 49, 77; 79, 80, 84, 95, 98, 100.

⁸² 2; 13, 18; 29, 37, 48, 56, 62, 69, 78.

⁸³ 10; 15, 20, 23; 32, 33, 38, 44, 45, 50; 51, 63.

⁸⁴ 1, 9; 14, 28; 34, 35, 36, 53, 73, 74, 75; 85, 89, 90, 97.

Providence—report that there is a “fair” amount of control over prostitutes; 11⁸⁵, that there exists little or no control. Thirty-eight cities do not report. The remaining 43 cities⁸⁶ report that responsibility for the control of the vice situation rests with the police department.

ARREST OF SEX OFFENDERS

Only 3 cities—Grand Rapids, Wilmington, and Waterbury—report that sex offenders of one kind or another are not arrested. Five others report that arrests are made in some cases. Des Moines depends upon education as the chief preventive against this kind of misdemeanor and states that arrests are made only in drastic cases. In Jacksonville and Peoria arrests are “occasional”; in New Bedford, “limited, offenders being generally condoned”; in Lynn, that arrests are made for sex offenses though not so charged. Ten cities⁸⁷ do not report. The 82 remaining indicate that arrests are generally made when circumstances justify.

Not all cities keep separate records of arrests of sex offenders. Thirty-seven cities, however, report as to the total number of arrests of this character as shown in Table VIII.

TABLE VIII.—Total number of arrests of sex offenders in 1923 in 37 cities

Number of arrests ranging from—	Cities
1 to 15.....	Rochester, Bridgeport, Evansville.
16 to 50.....	Dallas, Paterson, Spokane, Bayonne, Manchester.
51 to 100.....	Lowell, Wilkes-Barre.
101 to 200.....	Duluth, Fall River, New Haven, Oakland, ¹ Tacoma, Fort Wayne Lawrence.
201 to 400.....	Flint, St. Paul, Scranton, South Bend, Springfield, Wichita.
401 to 600.....	Newark, Atlanta, Richmond.
601 to 1,000.....	San Francisco, Cincinnati.
1,001 to 1,500.....	Cleveland, Portland.
1,501 to 2,000.....	Boston, Los Angeles, Akron, Tulsa. ²
2,001 to 3,000.....	New Orleans, Toledo.
6,000.....	St. Louis.

¹ Oakland, record of juvenile arrests, no data for adults.

² Tulsa, record of arrests for “year ending May, 1923.”

EXAMINATIONS

Of the 87 cities reporting that arrests of sex offenders are customarily or sometimes made, 75 make examinations for venereal-disease infections, while 7—Birmingham, Des Moines, Fall River, Fort Worth, New Haven, Norfolk, South Bend—have no such custom in practice. In the cities which do not require examination offenders are treated as are other criminals, and if convicted are fined, im-

⁸⁵ 25 ; 31, 32, 34, 48, 51, 53, 54, 75 ; 91, 98.
⁸⁶ 1, 2, 4, 5, 6, 7 ; 14, 16, 17, 20, 21, 22, 23, 24, 27 ; 33, 35, 36, 40, 42, 43, 44, 45, 46, 50, 56, 58, 62, 64, 65, 68, 69, 70, 73 ; 80, 81, 87, 88, 92, 93, 96, 99, 100.
⁸⁷ 1, 10 ; 14, 20, 28 ; 47, 76 ; 85, 90, 97.

prisoned, or placed on probation. One of these, New Haven, reports that examination is authorized by law, but not practiced; another, Des Moines, that according to State law examinations can not be made. Five additional cities—Albany, Utica, Evansville, Savannah, Somerville—make no report.

Of the 75 cities reporting that examinations are made, 22⁸⁸ report that all persons arrested for sex offenses are examined. Jacksonville reports that all city prisoners are examined; Sioux City, all criminals. Eleven other cities⁸⁹ report that examination is made only when infection is suspected; 6—Akron, Hartford, San Antonio, Tacoma, Youngstown, San Diego—routine examination of women only. Boston reports that “examinations are voluntary, conditional to being placed on probation or sentenced to 30 days or more”; Schenectady, that arrested persons are examined if they so desire. Seattle examines all prostitutes, but only those men arrested who are known to be infected. Indianapolis examines “all cases detained.” The 32 remaining of the 75 cities requiring examination do not specify as to the particular classes examined.

DETENTION

There are several ways of dealing with infected persons after they have been discovered through examination. While the reports are not in every case sufficiently specific to permit a classification in regard to these methods, much of interest is given. Of the 75 cities requiring examination, 62 report that infected persons are detained for treatment. The procedure in some cities is to send such persons to jail, to a house of detention, to a reformatory, to prison, or to some other correctional institution where treatment is administered. Twenty cities follow this plan. Ten others place emphasis on the medical aspect of the situation and send infected persons to city or county hospitals. The remainder do not specify as to procedure of detention.

Lynn and Tulsa report that persons after examination are not detained for treatment. In Boston, Cincinnati, Portland, Indianapolis, Cambridge, and Dayton, infected persons are paroled to clinics or other place of treatment. Five cities—New Orleans, Elizabeth, New Bedford, Yonkers, Schenectady—do not report as to whether infected persons are detained for treatment after examination.

The length of the period of detention is not usually stated. In many cases the sentence is for a term long enough for a satisfactory course of treatment. In other cases, for example, Atlanta, Erie, and St. Louis, persons are held until noninfectious. Camden reports,

⁸⁸ 3, 4, 7, 8, 11; 22, 24, 27; 48, 62, 63, 64, 65, 68, 69, 77; 79, 81, 82, 89, 94, 100.

⁸⁹ 6, 12; 18, 23; 40, 43, 51, 52, 70; 80, 99.

"detention until trial," without information as to disposition afterwards. Denver, Erie, and Kansas City (Kans.) report that only women are detained. In the latter city, however, men are released on bond. Lawrence reports only those detained who are found spreading infection, in which case they are placed on criminal charge and sent to the State infirmary. Two other cities reporting detention give enlightening information. Memphis states that prostitutes are "prosecuted, given advice, and transported in some cases;" Providence, that "some are fined; some jailed; others, ordered out of town." In most cases, information is lacking as to the disposition of persons found uninfected after examination.

INSTITUTIONAL REFORM OF SEX DELINQUENTS

Fifty-nine cities report some attempt at institutional reform, outside of sentences in jails and prisons; 22,⁹⁰ no work of this nature. The 19 remaining⁹¹ gave no information.

Public institutions, under the management of the city, county, or State, are those most frequently reported as undertaking such reform. Thirty-four⁹² out of the group of 59, state that such work is done in public institutions; 13,⁹³ in private; 18⁹⁴ do not specify.

As to the results apparent from institutional reform work, a variety of opinions are expressed. Eleven cities indicate that results are "good"; 7, "fair"; 7, "poor," "not satisfactory," or "not apparent"; 15, "questionable," "not known"; while 18 cities do not report. Philadelphia reports that arrests in 1922 were 25 per cent fewer than in 1921.

CARE OF UNMARRIED MOTHERS AND THEIR CHILDREN

Sixty-seven cities report some care of unmarried mothers and their children; 17,⁹⁵ no activities in this field; 16,⁹⁶ no report.

It is interesting to note that while work for reform is most often undertaken by public institutions, care of unmarried mothers and their children is generally assumed by private agencies. Forty-one cities⁹⁷ report private agencies doing work of this kind; 14⁹⁸ city or State activities; while 17 cities⁹⁹ do not specify as to whether this work is done by public or private agencies.

⁹⁰ 14, 15, 17, 25, 26; 31, 37, 48, 55, 56, 60, 71, 73, 75, 78; 80, 83, 90, 91, 92, 96, 98.

⁹¹ 1, 2, 10; 13, 20, 27, 28; 30, 50, 59, 65, 68, 69, 70, 74, 76; 85, 95, 97.

⁹² 3, 5, 6, 9, 11; 16, 18, 22, 24; 29, 32, 34, 39, 40, 41, 42, 43, 46, 47, 49, 51, 54, 57, 58, 61, 63, 72; 81, 82, 87, 88, 89, 99, 100.

⁹³ 3, 4, 6, 9, 11; 19, 23, 24; 52, 57; 86, 87, 93.

⁹⁴ 7, 8, 12; 21; 33, 35, 36, 38, 44, 45, 53, 62, 64, 67, 77; 84, 93, 94.

⁹⁵ 11; 26; 31, 49, 57, 58, 62, 65, 68, 71, 73, 75; 79, 80, 90, 91, 96.

⁹⁶ 1, 4, 8, 10; 19, 22, 28; 30, 47, 56, 67; 82, 85, 92, 93, 97.

⁹⁷ 3, 5, 6, 7, 12; 13, 16, 18, 21, 27; 32, 34, 37, 38, 40, 41, 44, 46, 48, 50, 51, 52, 53, 54, 55, 63, 64, 66, 70, 72, 76, 77, 78; 81, 83, 84, 86, 87, 89, 99, 100.

⁹⁸ 3; 15, 18, 20; 33, 39, 42, 43, 50, 69; 88, 94, 95, 98.

⁹⁹ 2, 6, 9; 14, 17, 23, 24, 25; 29, 35, 36, 45, 59, 60, 61, 74; 98.

SUPERVISION OF DANCE HALLS AND THEATERS

Three-fourths or 75 of the cities surveyed report some supervision of dance halls and theaters; 15,¹ none; 10 cities² furnish no data. Of the 75 cities with supervision, the large majority, or 58, leave such supervision to the police department or to special inspectors supplied by the city. One city, Buffalo, states that such work is under the office of the mayor. Dallas and Kansas City (Mo.) report that this work is done by welfare boards, while Paterson states that such activities are in charge of the "Recreation Department and Protective Officer." Thirteen cities³ do not report.

EXAMINATIONS TO DETECT NEURO-SYPHILIS

Only 5 cities—Detroit, St. Louis, New Bedford, Providence, Fort Wayne—report routine examinations to detect neuro-syphilis in persons responsible for serious accidents; 5—Chicago, Los Angeles, Hartford, El Paso, Knoxville—occasionally such examinations; 13⁴ do not report on this point. The remaining 77 cities state that they make no such examination.

Thirteen cities—Boston, Chicago, Detroit, St. Louis, Portland, Jacksonville, New Bedford, Oakland, Providence, Richmond, Bayonne, Fort Wayne, Sioux City—report regular examination of criminals to detect possible neuro-syphilis; 9—Los Angeles, Bridgeport, Duluth, Grand Rapids, Hartford, Houston, Nashville, El Paso, Knoxville—occasional examination; 66, no examination of this sort; 12,⁵ no report.

Nine cities—Boston, Chicago, Detroit, St. Louis, Portland, Richmond, St. Paul, Fort Wayne, Savannah—perform routine examination of loafers to detect neuro-syphilis; 5—Los Angeles, Cambridge, Dallas, Hartford, El Paso—occasional; 74, no such examination of this class; 12,⁶ no report.

Five cities—Chicago, Detroit, Richmond, Fort Wayne, Sioux City—report regular examination of anarchistic agitators for neuro-syphilis; 2—Los Angeles, Hartford—occasional; 78, no examination; 15,⁷ no report.

OFFICIAL AND NONOFFICIAL ATTITUDE TOWARD THE CONTROL OF
VENEREAL DISEASE

Seventy cities report the police as cooperative toward the general program for the control of venereal disease; 5 cities, the attitude of

¹ 7, 9; 29, 31, 41, 44, 48, 58, 63, 75, 78; 79, 83, 89, 93.

² 1, 10; 28; 30, 32, 47, 76; 85, 92, 97.

³ 12; 13, 19, 26; 35, 49, 57, 59, 61, 70; 82, 90, 95.

⁴ 1, 9, 10; 22, 24, 28; 30, 67, 77; 85, 88, 93, 97.

⁵ 1, 10; 16, 22, 28; 30, 67, 77; 85, 88, 93, 97.

⁶ 1, 10; 22, 28; 30, 48, 67, 77; 85, 88, 93, 97.

⁷ 1, 10; 24, 28; 30, 48, 51, 54, 67, 77; 85, 88, 93, 97, 100.

such officers as "fair"; and 11, that the police are opposed to the work, or are generally unfavorable toward it.

Seventy-five cities report the attitude of the courts as "favorable" toward the existing program for the control of venereal disease; 5 others, report a "fair" amount of cooperation; 9, that the attitude of the courts is "unfavorable."

Fifty-seven cities report physicians as generally cooperating in such program as exists for the control of venereal disease; 8, that there is a "fair" amount of cooperation. Twenty-three cities state that physicians are "indifferent," "unfavorable," or "opposed" to the program.

Analysis of statements regarding the attitude of the public on this question shows that 39 cities report a "favorable" or "cooperative" attitude; 9, a "fair" amount of cooperation. In 36 cities the program of venereal disease control is reported as unpopular with the public.

Material on the questionnaires in regard to the duties of probation officers and policewomen is, for the most part, limited and difficult to classify. It is possible, however, to state that 68 of the 87 cities which report probation officers or policewomen, or both, give some information as to duties of such officials, classified under four main headings as follows:

1. *Supervision of delinquents, including court assistance.*—In this class 12 cities report duties of the officers in question as "general"; in 7, as concerned with supervision of children, incorrigibles, or prostitutes; in 12, as probationary control; in 7, as case follow-up, including court wards. Ten cities report duties of these officials under the general head of "court assignments." In 4, officers make investigations for courts; in one, the officials in question "verify statements and recommend adjustments"; in another, such officers "enforce the law."

2. *Supervision to prevent delinquency.*—Duties of probation officers and policewomen in certain cities are classifiable under the general heading, "Supervision to prevent delinquency." In 3 cities, officers under this heading perform work of a general nature; in 13, officials are concerned with supervision of amusement places; in one, investigation of homes unfit for children.

3. *Assistance in matter of venereal-disease treatment.*—In various cities probation officers or policewomen give assistance in the matter of treatment. Two report officers specially assigned to venereal-disease cases. In one city provision is made for accompanying prisoners to clinics; in 4, officials are concerned with follow-up work in reference to treatment.

4. *Protective powers.*—Six cities report that probation officers and policewomen are mainly engaged in protective work.

PROBATION OFFICERS

Three-fourths, or 75 of the cities covered by the present survey, report probation officers; 11⁸ have no such officers; 14⁹ furnish no information. A few cities give the number of persons thus employed. In Group I, Cleveland reports 6 probation officers, Philadelphia, 15; in Group II, Indianapolis, 5. In Group III, Flint reports one probation officer; Duluth, Lynn, Oklahoma City, Reading, Spokane, each 2; Springfield, 4. In Group IV, Lawrence reports one probation officer; El Paso, 2.

In most cases it is probable that such workers are provided by the city. In a few cases, however, it is definitely stated that such persons are county officers or members of nonofficial agencies.

POLICEWOMEN

Sixty-five cities report one or more policewomen; 23¹⁰ that they have no such officers; while 12 cities¹¹ make no report. Twenty-seven of the 65 give the number employed. Thus each of the following cities—Rochester, Duluth, Elizabeth, New Haven, Reading, Bayonne, El Paso, Savannah, and South Bend—reports one policewoman. Eleven cities—Cincinnati, Columbus, Denver, Newark, Fall River, Flint, Nashville, Richmond, Tacoma, Trenton, and Lawrence—report 2 such officers each; Cleveland, 2 to 3; Louisville, Lowell, St. Paul, Springfield, 3; Boston, 5; Indianapolis, 22. The remaining 38 cities reporting such officers do not state the number.

EDUCATIONAL CAMPAIGN

From the general purpose of the investigation, it would naturally be assumed that questions under the section, "Educational Campaign," refer to the educational activities of municipal health departments. However, answers received indicate different interpretations of these questions, and in various cases activities of other official agencies as well as of certain voluntary agencies, are mentioned. In the present analysis, it has been assumed that answers listed on the questionnaire refer to the municipal health department, unless otherwise stated, in which case exceptions are noted. For the reason mentioned, such figures as are given should not be taken as entirely conclusive.

SCHOOLS

Twenty-five cities¹² report efforts toward sex education in schools. Fourteen cities¹³ report regarding these activities, "little,"

⁸ 7; 26; 32, 35, 45, 48, 71, 73; 92, 96, 100.

⁹ 1, 10; 14, 15, 24, 27; 30, 56, 76, 78; 85, 89, 97, 99.

¹⁰ 9; 18; 33, 35, 36, 44, 47, 48, 49, 56, 57, 58, 60, 65, 67, 73, 74; 79, 83, 88, 90, 98, 100.

¹¹ 1, 8, 10; 23, 27; 30, 77, 78; 85, 93, 97, 99.

¹² 4, 5, 8, 11, 12; 13, 18, 20, 22; 39, 46, 48, 49, 56, 58, 59, 61, 67, 68, 71; 80, 84, 94, 99, 100.

¹³ 7; 16, 21, 26; 32, 35, 41, 57, 62, 63, 78, 79, 86, 92.

“casual,” or “not much”; 5—Portland, Washington, Yonkers, Schenectady, and Troy—furnish no information on this subject. The remaining 56 state that no sex hygiene is taught in the schools.

St. Louis and Cincinnati state that educational work is done by the local social hygiene society. In the latter sex hygiene courses given by men and women lecturers have been made available for school teachers, and about 50 lectures have been given to groups of upper grade school children. Milwaukee reports that the “Y. M. C. A. gives talks in the high school indirectly on sex subjects.” In Spokane work of this nature is done by the health and sanitation committee of the chamber of commerce, by means of lectures and lantern slides; in Wilkes-Barre and Hartford, by the Board of Education; in Camden, by the State in cooperation with the city.

CHURCHES

Seventeen cities¹⁴ report sex education work in churches; 16 others,¹⁵ a limited amount of this work; 9,¹⁶ no report. Fifty-eight cities report that there is no sex education in churches.

SOCIETIES

Twenty-five cities¹⁷ report social hygiene education in societies; 15,¹⁸ a limited amount; 15,¹⁹ no report. The remaining 45 cities report that they have no such activities.

PAMPHLETS, EXHIBITS, MOTION PICTURES

Seventy cities report the use, in some degree, of pamphlets and of exhibits or motion pictures, or both; 25,²⁰ that these aids are not used; 5 cities—Louisville, Washington, Knoxville, Somerville, and Troy—no report. Comparatively few cities give any details as to the use of these aids.

PROVISION OF LITERATURE IN LIBRARIES

Twenty-six cities²¹ report that literature on the subject of sex hygiene is provided in libraries. One of these, Boston, reports that the State department of health furnishes public libraries with material, and that the Massachusetts Society for Social Hygiene maintains a

¹⁴ 3, 4, 8, 11; 13, 18; 34, 37, 41, 56, 58, 61, 71, 72; 83, 94, 99.

¹⁵ 2, 7; 21, 25; 35, 38, 45, 49, 62, 63, 70, 76, 78; 79, 86, 100.

¹⁶ 1; 28; 47, 54, 77; 84, 88, 93, 97.

¹⁷ 2, 3, 4, 6, 8, 11; 13, 18, 20, 22, 24; 34, 37, 46, 48, 58, 60, 61, 62, 71, 72; 83, 85, 94, 99.

¹⁸ 7; 21, 25, 26; 29, 30, 35, 45, 49, 63, 70, 78; 79, 86, 100.

¹⁹ 1, 10; 27, 28; 38, 47, 54, 56, 59, 77; 84, 88, 92, 93, 97.

²⁰ 10; 14; 31, 33, 36, 37, 41, 42, 44, 47, 54, 55, 60, 62, 64, 66, 67, 70, 72, 73, 75; 82, 84, 85, 98.

²¹ 2, 3, 6, 8, 10, 12; 15, 18, 20, 21, 24; 38, 40, 43, 48, 55, 59, 61, 68, 70, 71, 72; 80, 81, 88, 94.

free library of 1,200 volumes on sex hygiene, from which about 150 volumes are circulated monthly in the city of Boston. Pittsburgh reports that "books are available on request." Three others—Cincinnati, Richmond, and Allentown—state that such literature is provided in a small or limited degree. Eleven²² furnish no data. The remaining 59 cities report no provision of literature on sex hygiene in libraries.

"KEEPING FIT" CAMPAIGNS

Thirty-four cities²³ report "keeping fit" campaigns. Sixteen²⁴ make no report. The remaining 50 cities state that they have no special educational work of this sort.²⁵

OTHER ACTIVITIES

Other educational activities which are reported are usually activities of agencies other than the city health department. Sixteen cities report work of such nature. Of the largest cities Boston indefinitely reports, "education against 'quack' remedies and self-treatment." The report from Chicago notes cooperation of the press, this resulting in a freer discussion of the subject of venereal diseases. Cleveland reports "indirect activities through the Boy Scouts and Camp Fire Girls organizations." New York carries a large program through the Public Health Education Bureau. Portland, in Group II, reports "Lectures and newspaper articles." The report on Toledo states that the "Social Service Federation is active to some extent in trying to improve housing conditions which are said to favor vice in general." In Group III, Des Moines reports, "articles in newspapers"; Elizabeth, occasional lectures, talks, and articles in newspapers. Hartford reports a Social Hygiene Society, whose program is entirely educational. The report adds, however, that the society "is at present practically inactive." Nashville reports lectures delivered under the auspices of the State Department of Health, which agency has also supplied literature to clinics and nursing organizations; New Bedford, that "several meetings, with lectures, have been held to educate the public." Oklahoma City, in reporting on this point, stresses the "advice given to patients and others at clinics."

²² 7; 19, 28; 54, 77; 83, 87, 92, 93, 95, 97.

²³ 5, 8, 11, 12; 17, 18, 21, 24, 27; 29, 30, 34, 37, 38, 39, 45, 49, 50, 58, 59, 60, 61, 62, 64, 69, 70, 71, 72, 74, 75, 78; 79, 80, 99.

²⁴ 1, 2, 3, 4, 6; 19, 20, 28; 54, 63, 77; 87, 92, 93, 95, 97.

²⁵ EDITOR'S NOTE.—The original questionnaire phrased the question as "Keeping Clean Campaigns and Value of Soap and Water." The replies indicate that considerable confusion arose over the meaning of this question. Apparently most of the replies covered "keeping fit" campaigns which were extensively promoted by the United States Public Health Service and the American Social Hygiene Association; many evidently thought this referred to general clean-up campaigns; some have probably considered that it referred to cleanliness in relation to sexual contacts.

Omaha reports only that "lectures on the necessity of educational health campaigns have been given to segregated audiences." Scranton's report on this item is brief—"lectures." Very general and sporadic activities are reported by the city of Wilkes-Barre, in Group IV, these being under semi-official agencies, such as the Visiting Nurses' Association. St. Joseph reports some work in connection with the Red Cross Clinic. Twenty-nine cities²⁶ state that they have no "other activities" of an educational nature. The 55 remaining cities do not report as to "other activities."

ACCOMPLISHMENT

The reports of 41 cities indicate that various educational activities have yielded results. Eight cities²⁷ indicate "some," "limited," or "very little" accomplishment; 13²⁸ find it impossible to estimate, are "doubtful" or "indefinite"; 18²⁹ no accomplishment along educational lines; 20 cities³⁰ make no statement on this point.

Twenty of the 49 cities reporting varying degrees of accomplishment by educational measures indicate that such measures have led to an increased demand for treatment. Twenty-three cities emphasize the value of educational activities to the general public. Of these cities, Newark reports that "inquiries received indicate something accomplished in a general educational way"; Omaha, that "the public is willing, indeed anxious, to be informed as to the prevention and control of venereal disease," while "before the war it was almost impossible to get an audience who would allow a speaker to mention venereal disease." Providence reports, "widespread interest and awakening of the public to venereal-disease danger and great economic loss"; Boston, that "venereal infection is no longer regarded as a joke"; Buffalo, "general knowledge of sex matters and venereal disease"; Cincinnati, "many have learned the fundamentals of sex hygiene and probably many have been spared the acquisition of venereal disease." An additional city, Reading, somewhat vaguely reports, "failed to popularize subject; probably awakened sense of dangers; public averse to publicity." Three cities—Detroit, Birmingham, and Kansas City—report simply that there has been reduction in venereal disease. Minneapolis reports, "stimulated cooperation of doctors and public." The report on Memphis states that the work done by the city health department, in the matter of handling obstinate cases, has earned the cooperation of physicians in many instances. Additional points noted, as

²⁶ 7; 15, 16; 29, 32, 36, 42, 43, 44, 47, 48, 52, 60, 64, 66, 68, 69, 73, 75; 80, 82, 84, 88, 89, 91, 92, 94, 95, 98.

²⁷ 43, 57, 58, 63, 74; 79, 89, 100.

²⁸ 1; 13, 29, 34, 37, 41, 55, 56, 67, 68, 69, 76; 99.

²⁹ 11; 16, 27; 33, 36, 42, 44, 60, 64, 66, 73, 75; 81, 82, 85, 88, 91, 96.

³⁰ 4, 9, 10; 14, 19, 23, 28; 51, 54, 62, 77, 78; 84, 87, 90, 92, 93, 95, 97, 98.

the result of activities on the part of the Memphis city health department, are the establishment of "a large venereal-disease clinic," and "support by the police department and the lower courts." Jersey City reports, "no prostitutes in city"; Portland and Hartford, abolition of restricted districts. Four cities—Buffalo, Portland, Tacoma, and Knoxville—report a decrease in the number of persons resorting to quacks and quack remedies. St. Louis, in reporting, comments upon the greater publicity in the newspapers as resulting from the educational campaign. Kansas City, Mo., is "unable to state" what educational measures have accomplished; Richmond has "no definite figures or statements"; and Spokane "does not know." The remainder of the 49 cities reporting accomplishment from educational measures do not specify as to kind.

VIII. INFANT HYGIENE

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Interest in the child hygiene movement in this country has grown tremendously since the first municipal division of child hygiene was established in New York City in 1908. This increased interest has led to the gradual development by local, State, and national agencies, of both official and voluntary origin, of broad programs for the reduction of preventable sickness and deaths among mothers and infants and the promotion of healthy living. That official bodies are assuming more and more of the responsibility for this service is shown by the creation of new bureaus or divisions in health departments and the increase in allotments of funds and personnel for the work.

ORGANIZATION

In 72 of the 100 surveyed cities the health department makes provision for care of children under school age, although in two cities¹ this service is limited to preschool clinics held in the summer, while in three others² the health department supplements the funds or staffs of visiting nurse associations. Voluntary agencies carry on all the activities for the protection of maternity and infancy in the remaining 28 cities.

Of the 37 cities having separate bureaus or divisions for infant hygiene work 26³ have a special division of infant hygiene, while 11⁴ include this activity under the broader division of child hygiene which embraces school health supervision. In six cities⁵ infant hygiene is combined with the nursing division work, while in 29 cities,⁶ including 5 mentioned in the previous paragraph, the work is supervised directly by the health officer, there being no organized

¹ Louisville and Lynn.

² Columbus, Erie, and Reading.

³ Baltimore, *Boston*, Cleveland, Detroit, *Los Angeles*, *Philadelphia*, St. Louis, Indianapolis, *Jersey City*, *Milwaukee*, Newark, New Orleans, Seattle, Washington, Dallas, Houston, Memphis, Scranton, Syracuse, Wilmington (State health and welfare commission), Yonkers, Allentown, Bayonne, Lawrence, San Diego, and Somerville. Those in italics have full-time medical directors.

⁴ *Buffalo*, *Chicago*, *New York*, *Pittsburgh*, *San Francisco*, *Cincinnati*, *Portland* (State Board of Health), *Bridgeport*, Jacksonville, *Providence*, and *Trenton*. Those in italics have full-time medical directors.

⁵ Birmingham, Camden, New Bedford, Norfolk, San Antonio, and El Paso.

⁶ Columbus, Louisville, Akron, Atlanta, Rochester, Cambridge, Dayton, Des Moines, Duluth, Elizabeth, Erie, Fall River, Flint, Grand Rapids, Hartford, Lynn, Lowell, Nashville, New Haven, Reading, Richmond, Paterson, Salt Lake City, Worcester, Manchester, Savannah, Schenectady, Troy, and Waterbury.

division of infant hygiene. In footnotes 1 and 2 the 15 cities having full-time medical directors are given in italics. Fifteen other cities have part-time medical directors, 9 have nurses as directors, and 1, Indianapolis, has a nonmedical, full-time director of infant and preschool work. It is gratifying to observe that progress has been made since 1920 in the establishment of at least six new bureaus or divisions, while Los Angeles, Pittsburgh, Portland, San Francisco, and Trenton have secured full-time medical directors of child hygiene work.

Voluntary agencies supplement the work of official agencies, and as previously mentioned, do all the work in 28 cities. Visiting nurse associations are particularly active in the field, usually supplying or supplementing the field nursing service, and in several cities, as in New Haven and Worcester, conducting the prenatal and infant welfare clinics. In Minneapolis this work is effectively handled by the Infant Welfare Society whose functions are threefold and include problems of prenatal care, infant and preschool hygiene, home nursing of prenatal cases being supplied by the visiting nurses. In Chicago, as in many other large cities, both official and voluntary agencies are active, the work of the Infant Welfare Society in the fields of prenatal, infant and preschool care being fundamentally educational in character.

EXPENDITURES

In view of the fact that prenatal and infant hygiene work is usually carried on by several different agencies in the community, it is impossible to give a fair picture of the cost of this service. Information available for 8 cities as to the 1923 expenditures by the health department for this activity show that an average of 7 cents per capita was expended. Three of the cities expended from 3 to 4 cents per capita, 3 from 7 to 8 cents, and 2 from 9 to 11 cents. The salaries of full-time medical directors in 13 cities ranged from \$2,200 to \$5,000, with a median of \$3,600. Salaries of part-time directors in 8 cities furnishing this information ranged from \$1,200 to \$3,800 with a median of \$2,300.

PERSONNEL

It is interesting to note the personnel engaged in prenatal and child hygiene work by health departments in a selective group of cities, although this by no means represents the entire personnel employed in these cities by both official and voluntary agencies. Information on the latter question is not sufficiently complete to present a fair picture for any number of cities.

In 20 cities for which information is available as to the health department personnel engaged in prenatal, infant and preschool work, it is found that there are 99 physicians, 6 of whom are on a full-time basis, or an average of approximately 5 physicians per city, cities of Group I having an average of 10.4, those of Group II and III each having an average of 3.5, those of Group IV, an average of 1.3. In several cases the nurses (total 394) were engaged in general community nursing, as in Milwaukee, and hence did not give their entire time to this work, although they were full-time employees of the department. There were 26 dentists, chiefly in the largest cities, and 41 other persons, as clerks, a glance at the table indicating the lack of clerical assistance in the smaller cities.

TABLE I.—*Health department personnel engaged in prenatal, infant, and preschool work, 1923*

Cities with population of—	Number of cities	Physicians	Nurses	Dentists	Others
500,000 and over.....	5	¹ 52	159	24	28
250,000 to 500,000.....	5	¹ 18	120	1	11
100,000 to 250,000.....	7	¹ 25	106	1	1
70,000 to 100,000.....	3	4	9	0	1
All cities.....	20	99	394	26	41

¹ Two full time.

PRENATAL CARE

Prenatal clinics are conducted in 73 cities. These clinics are maintained by official agencies in 31 cities, by voluntary agencies in 32 cities, and by both municipal and voluntary support in 10 cities. Visiting nurses provide care and advice to expectant mothers in their homes in the remaining cities which apparently had no prenatal clinics in 1923. Information for 29 cities indicates that an average of 9 prenatal cases per 100 births (including stillbirths) were under observation at prenatal clinics during the year. Unfortunately, data are not sufficiently complete to show the number of visits to these clinics by expectant mothers. The proportion of expectant mothers thus cared for varied from less than 1 per cent in one city, where the work was just being organized, to 20 per cent or more in Boston, Birmingham, Kansas City, Mo., Minneapolis, and New Haven, where prenatal clinics are operated almost entirely by voluntary agencies, except in the case of Birmingham, where this work is done by the health department.

The Maternity Center Association in New York attempts in its program to assure each mother the minimum of mental and physical discomfort during pregnancy, a maximum of mental and physical fitness at its termination, with the reward of a well baby and the knowledge whereby mother and baby may be kept well. It also

endeavors to teach the community the value and need for such care for every mother.

This expresses the ideal which should be before every organization doing prenatal or maternity work, whether official or voluntary. It is because of the growing realization of the need for such service that we find the present development of prenatal work. As in other phases of child hygiene work, however, methods and details vary widely, from mere registration and advice regarding adequate medical attention to clinic service and regular follow-up work. If the clinic is to be of greatest value, early registration and regular attendance are necessary. Efforts to make these factors possible are secured by the canvassing of districts by nurses, by contact with expectant mothers through generalized nursing services, by reference of cases to clinic by physicians, social agencies, or midwives, and by recommendations of other mothers.

As an illustration of a comprehensive program in operation, the work in Minneapolis may be cited. The prenatal department of the Infant Welfare Society, under a medical director, maintains stations at four settlement houses where prospective mothers, who can not otherwise obtain care during this important period, may receive medical examinations and advice for themselves and for their future babies, as well as post-partum examinations. The visiting-nurse association makes home follow-up visits. The four clinic physicians are paid at the rate of three dollars per clinic and none of them take clinic cases as private patients. Clinics are also operated at the university and general hospitals. A report is sent to the maternity hospital, or to the private physician who is to deliver the patient, approximately one month before delivery. It may be mentioned in passing that in 1923, 93 per cent of the deliveries were made by physicians, 65 per cent occurring in hospitals.

MATERNITY CARE

Unfortunately, information secured by these surveys concerning the proportion of births occurring in hospitals is not sufficiently complete to warrant discussion here. The small amount of available data in regard to outpatient obstetrical care indicates either very inadequate provision of services of this character or difficulty in securing information concerning this problem. It is apparent that in many cases where agencies do exist, coordination is needed for greater efficiency and for the better protection of mothers in child-bearing. More effective supervision and more thorough training of midwives is likewise needed.

In the surveyed cities, variation in methods and efforts of supervision of midwives is so great that it is difficult to make accurate

deductions. The 86 cities for which data are available may be roughly classified into five groups, as follows:

In 52 cities activities of midwives are regulated by State provisions.

In 10 cities⁷ activities of midwives are regulated by local provisions.

In 8 cities⁸ both State and local regulations exist.

In 12 cities⁹ practice of midwifery is illegal.

In 4 cities¹⁰ there are no legal provisions.

In some instances the legal provisions require examination before a license is issued for the practice of midwifery, but in other cases only registration is required. Even in the placing of responsibility for registration there is considerable variation, from cities such as Kansas City, Kans., and Omaha, where midwives are registered by the city clerk or registrar, to the groups regulated by State provisions. Of the latter group, in five cities¹¹ midwives are registered by the State board of medical examiners, and in five cities¹² by the State medical registration board. Of the 12 cities where the practice of midwifery is illegal, 10 are controlled by the State law of Massachusetts¹³ and 2 by the State law of Iowa.

In 58 cities furnishing data, 4 estimate¹⁴ that less than 1 per cent of all births are attended by midwives. In 16 cities midwives attend between 1 and 10 per cent; in 14 cities, between 10 and 19 per cent; in 16 cities, between 20 and 29 per cent; in 4 cities,¹⁵ between 30 and 39 per cent; and in 4 cities,¹⁶ 40 per cent and over. It is learned that in 48 out of 85 cities midwives are required to report births, stillbirths, and septic cases; in 31 cities reports of births and stillbirths are required; in 4 cities reports of births and septic cases are required, while in 2 cities reports of births are required.

In 44 cities supervision of some kind is exercised over midwives by physicians or nurses, while in 25 cities evidently no attempt is made to supervise their work. For the remaining cities no information is available concerning this question. In Cincinnati, for ex-

⁷ Detroit, New York, Birmingham, Jacksonville, Norfolk, Spokane, Omaha, Richmond, El Paso, and Manchester.

⁸ Buffalo, Jersey City, Milwaukee, Camden, Savannah, New Haven, Syracuse, and St. Joseph.

⁹ Boston, Cambridge, Des Moines, Fall River, Lowell, Lynn, New Bedford, Springfield, Worcester, Lawrence, Sioux City, and Somerville.

¹⁰ Houston, Oklahoma City, San Antonio, and Wichita.

¹¹ Milwaukee, Minneapolis, St. Paul, Duluth, and Elizabeth.

¹² Cleveland, Cincinnati, Akron, Dayton, and Youngstown.

¹³ EDITOR'S NOTE.—While the practice of midwifery in Massachusetts is illegal, and hence not recognized by responsible authorities, midwives nevertheless continue to practice their trade, and the percentage of these illegal deliveries varies in different cities. The official records do not tabulate this data, the only source of information being the birth or death certificates.

¹⁴ Birmingham, Cambridge, Camden, and Kansas City, Kans.

¹⁵ Newark, Bridgeport, Jacksonville, and Savannah.

¹⁶ New Orleans, Bayonne, El Paso, and Elizabeth.

ample, supervision covers inspection of equipment and technique by nurses, while in Bridgeport and New Haven midwives have formed associations and are under the supervision of a State supervisor of midwives, as well as of the local health departments.

It is evident that more emphasis should be given to training facilities, when it is noted that 47 of the 75 cities reporting on this question indicate that no effort is made to train midwives. Of the 28 cities where some effort is made, this training consists chiefly of lectures or personal instruction. In only two cities are courses of any length given—a nine months' course in New York and an eight months' course in Newark.

OPHTHALMIA NEONATORUM

In 81 cities the routine use of prophylactic silver-nitrate solution is required, while 84 cities require notification of cases. Although this is a decided gain over the situation in 1920, the value is somewhat minimized by the fact that in only 41 cities are records kept of cases reported and of treatments given.

BIRTH REGISTRATION

It is noteworthy that continued progress has been made in securing early reporting of births. In 1923, there were 30 States and the District of Columbia from which birth records were gathered with sufficient accuracy to have been officially recognized by the United States Bureau of the Census, while three more States, Florida, Iowa, and North Dakota, were added to the birth registration area in 1924. Seventy-seven of the cities surveyed were in the birth registration area in 1923, while 21 others were in the registration area for deaths but not for births.

City health departments have attempted in many ways to stimulate prompt reporting of births, by educating the people as to the many values of a birth certificate—for school entrance, for foreign travel, and for business purposes—as well as by issuing in a few cities particularly attractive certificates which parents are eager to secure. In several cities birth certificates are routinely delivered to parents by nurses.

INFANT MORTALITY

The deaths under one year per 1,000 births for 95 of the cities studied, range from 48 in Spokane and Tacoma to 169 in El Paso. There is need for a careful analysis of the causes of differences in infant mortality rates. As well pointed out in the American Child Health Association statistical report of infant mortality for 1924,

it must be borne in mind that completeness of reporting, race, nativity stock, climate and occupation, among other factors, each exert an influence as well as the amount of public health work conducted. It is noteworthy, however, that whereas in 1920 only 23 per cent of the cities had infant mortality rates of 80 or less, in 1923 half the surveyed cities were thus credited. Only 5 cities in 1923 had infant mortality rates of over 110, as compared with 12 in 1920. The geographical distribution according to infant mortality rates for 95 of the largest cities of the United States is shown in the following table:

TABLE II.—*Geographical classification of cities according to infant mortality rates, 1923*

Geographical classification of cities	Number of cities	Number of cities with infant deaths under 1 year of age per 1,000 births of—		
		48 to 80	80 to 110	Over 110
New England.....	16	7	8	1
Middle Atlantic.....	23	11	12	0
North Central.....	27	20	7	0
South Central.....	12	3	7	2
South Atlantic.....	8	0	6	2
Mountain and Pacific.....	9	9	0	0
All cities.....	95	50	40	5

Among the outstanding facts shown by this table may be noted the relatively large proportion of North Central, Mountain, and Pacific cities with rates of 80 or less. The northern city with a rate higher than 110 (Manchester, 117 in 1923; 93 in 1924) has an active program of prenatal and infant care, but an institution for infants drawing from outside the city undoubtedly affects the infant mortality rate, which nevertheless, shows a significant downward trend. It is most satisfactory to observe marked improvement in the saving of infant lives in so many cities during the three-year period since the last survey (1920), for this is coincident with and doubtless influenced by an extension of infant-welfare programs in the majority of surveyed cities. Were the data available, it would be even more instructive to analyze the situation for the first month of life, as well as for the first 12 months.

INFANT-WELFARE STATIONS

As nearly as can be ascertained, infant-welfare stations are provided in 94 of the surveyed cities, although information is not sufficiently complete to indicate the number of stations in individual cities.

TABLE III.—*Classification of cities according to agencies providing infant-welfare stations*

Cities of—	Number of cities in which infant-welfare stations are provided by agencies				
	Muni- cipal	Volun- tary	Both	None	Total
Group I.....	8	0	4	0	12
Group II.....	6	6	3	1	16
Group III.....	19	22	6	3	50
Group IV.....	7	12	1	2	22
All cities.....	40	40	14	6	100

From Table III it may be observed that in 66 per cent of the cities of Group I, in 38 per cent each of the cities of Groups II and III, and in 32 per cent of the cities of Group IV, the infant welfare stations are provided entirely by municipal agencies. In Toledo, Fort Worth, Tacoma, Tulsa, Fort Wayne, and Savannah, infant care is evidently confined largely to home-nursing work.

In the majority of cities these clinics or infant welfare stations receive preschool children (2 to 6 years of age) as well as infants (under 2 years). This work is conducted in the more progressive cities by a regular professional personnel, adequately paid. Such clinics include physical examinations, regulation of feeding or diet, advice to mothers, and follow-up visits to the homes to ascertain whether or not the suggestions made are understood and carried out. As in 1920, in many of the cities where infant welfare stations are under official auspices, nursing service is often provided by private agencies. Whether clinic service is provided by official or private agencies, there usually exists excellent cooperation with different social and welfare organizations in the city, as well as between the various health groups themselves.

The infant welfare work of Boston voluntary health agencies consisted in 1923 largely of that performed by what was formerly the Boston Baby Hygiene Association, but, by merger with the Instructive District Nursing Association, later became the Community Health Association. This organization operates from 15 main health stations, with 21 sub-stations. The work carried on at these centers consists of weekly well-baby conferences at which breast feeding is encouraged. Babies are weighed and inspected and those not doing well are referred to physicians, while mothers' conferences are held, dietary advice is given, and follow-up work by home visitation is carried on.

The Boston Health Department has developed a plan whereby the three Grade A medical schools, Harvard, Tufts, and Boston University, furnish the medical personnel which functions at the baby

and preschool-age weekly conferences. The medical personnel in each instance is supervised by the professor of pediatrics of the respective schools and the city of Boston pays each medical school for the service rendered. This assures the babies of Boston the highest type of pediatric service free from interference of political preference and placement. The nursing division is linked up with the Simmons College department of public health nursing whereby the students at the latter institution receive an opportunity for doing field work in child hygiene.

In San Francisco, in addition to the infant-welfare clinics operated by the health department, there is the children's health center, started in 1909 under the auspices of the American Association of University Women. Its work is educational. The center is open daily from 9 a. m. until noon and one afternoon during the week, for the conduct of prenatal work through lectures and demonstrations, for three infant welfare clinics weekly and for one preschool clinic.

In Minneapolis, as in 40 of the 94 other cities where infant welfare clinics are provided, these services are made possible through a voluntary organization, the infant welfare society, under a special medical director for infant work. Clinics are conducted for well babies of parents who are unable to pay a private physician for this service. A well organized group of volunteers assists at clinics in the taking of records, weighing of babies and in other important services.

The chief aim of these infant-welfare stations is to keep the healthy baby well, although the best stations are equipped to make diagnoses. It is most essential that a physician be in attendance at clinics in order to make examinations and give advice, while nurses likewise have a prominent part in assisting with examinations, in giving instructions to mothers and in the later visits in the home to encourage clinic attendance and to make certain that instructions given are practical and are understood. There are always, too, a certain number of infants who for one reason or another do not come to clinics and often these children need care as much or more than those who are in regular attendance. Breast feeding is encouraged, since it is known that most women can nurse their babies. Registration and regular attendance at clinics are secured through visiting nurses, school nurses, friends, and other members of the family. This measure is proving effective in that it offers the natural approach to the child and the family, chiefly through the influence of the nurse.

As another concrete illustration of the type of service rendered in some cities, it may be appropriate to refer to the 1924 report of

the Infant Welfare Society of Chicago. Mothers in the congested sections of the city bring their babies to an infant-welfare station, where conferences are conducted twice a week. The babies are first weighed by a volunteer worker furnished by the centers of the woman's auxiliary. The babies are then taken to the doctor's table, where a careful examination is made and the mother instructed in ways to keep her baby well. An interpreter is provided for mothers who can not speak English. Every baby is called on in its home by the nurse at least once a month. Young mothers are taught how to bathe the baby in the way that is best for the baby and easiest for the mother. Every effort is made to teach the mother how to keep her baby breast fed for the advised length of time, but if a milk modification is necessary the nurse teaches her this procedure. In the work with the preschool child very much the same routine is used as with the babies, except that trained dietitians take the place of nurses.

THE PRESCHOOL CHILD

In his instructive book on the preschool child,¹⁷ Doctor Gesell discusses many problems underlying the administration and organization of preschool hygiene and suggests that "the whole field of preschool hygiene is in such a state of formativeness that it would be hazardous to be either too dogmatic or prophetic." He points out that the objectives of this work are double—the prevention of and the timely treatment of disease and handicap.

There are definite signs of progress in this work in the surveyed cities since 1920. A large proportion of the cities provide some facilities for care of the preschool child, although in most cases these provisions are offered through the regularly organized infant-welfare stations and separate figures are rarely ever available.

In Boston the well-child conferences for children of preschool age are provided by the Community Health Association at its various health centers. During 1923 there were 2,175 baby and child health conferences held, with an average attendance of 12 children of preschool age at each conference. In addition, visiting nurses from the association made 27,145 home visits to 3,856 children of these age periods. Nine hundred and sixty-six children with correctible defects but not registered at the conference were visited. Dental services are furnished at the Blossom Street health center of the health department and in several other districts. The Community Health Association provides 100 nutrition workers in as many health centers for work exclusively among children of preschool age who are referred from the well-child conferences. At five mental clinics approximately 600 children are registered.

¹⁷ The Pre-School Child, Arnold Gesell, M. D., Houghton-Mifflin Co., 1923.

Nursery schools and habit clinics have been organized in connection with the health centers.

In Grand Rapids a preschool clinic is held at each infant welfare station, in addition to special nutrition clinics, to prepare the child to enter school with physical defects having been corrected. The Lowell Guild, under which the local instructive nursing and baby hygiene activities are carried on, operates a preschool clinic in connection with its well baby and mother conferences, 547 children being registered. In San Diego parent-teacher associations hold six clinics a month in different school buildings. The work is carried out by the voluntary service of 11 physicians and 6 dentists, in addition to the nursing care.

The Chicago Infant Welfare Society reports that at 13 stations nutrition conferences are held weekly for the 2-to-6 year old children, with a total attendance during the year of over 9,000. In Minneapolis, where the Infant Welfare Society also carries on this work, the supervisor has had special experience in child-training problems. She is assisted by a Merrill Palmer graduate and by student volunteers from the home economics department of the University of Minnesota. Forty-eight clinic sessions were held in 1923 for well children who presented definite problems of child training. Cases are referred by the nurses of the infant department, by the visiting nurses, and by the family-case workers who have recognized this problem. Extreme behavior problems are cared for by the child guidance clinic. Special attention is also given by physicians and staff members to the nutrition of the children and to the correction of physical defects.

The association for improving the condition of the poor in New York has continued its excellent work, described in the 1920 report, carried on partly in health stations and partly in the home. In New Haven the Yale psychoclinic is available to social agencies and persons desiring the psychological examination of children who present educational or behavior problems, while preschool clinics are also conducted in conjunction with the well-baby conferences of the Visiting Nurse Association.

SCOPE OF WORK

In view of the fact that information concerning registration at infant welfare stations applies to preschool children as well as to infants, it is not possible to estimate for any number of cities the proportion of infants born in 1923 who were under supervision. Data secured from 59 cities, however, and classified in Table IV, indicate that 227,062 children (8.8 per 1,000 population) registered at infant welfare stations averaged approximately eight visits per

clinic. The frequency of visits varied directly with the size of cities, although a larger proportion of children were under clinic observation in cities of less than 250,000 than in larger cities.

TABLE IV.—*Clinic attendance by infants and preschool children, and home visits by nurses, 1923*

Cities of population of—	Number of cities	Total population	Number children registered at clinics		Number of clinics visits		Number of home visits by nurses		
			Total	Per 1,000 population	Total	Per child	Total	Per child	Per 1,000 population
500,000 and over.....	11	16,366,588	128,059	7.8	1,413,985	11.0	762,096	5.9	46.5
250,000 to 500,000.....	14	5,011,766	46,074	9.2	216,434	4.7	331,582	7.2	66.2
100,000 to 250,000.....	23	3,414,044	41,349	12.1	161,310	3.9	481,453	11.6	141.0
70,000 to 100,000.....	11	981,698	11,580	11.8	40,139	3.5	65,309	5.6	66.5
All cities.....	59	25,774,096	227,062	8.8	1,791,729	7.8	1,640,440	7.2	63.6

An average of 7.2 home-nursing visits were made for each child attending clinic, the number being largest in the 23 cities of 100,000 to 250,000 population. Home-nursing visits in behalf of infants and preschool children in those 59 cities averaged 63.6 per 1,000 population. In Columbus, Dayton, Los Angeles, Bridgeport, and New Haven these visits were made by nurses working on the district plan of generalized nursing.

SUMMARY AND CONCLUSIONS.

1. Provision for the health supervision of children under school age is made by the health departments of 72 of the 100 surveyed cities. Voluntary agencies carry on all the activities for the protection of maternity and infancy in the remaining 28 cities and co-operate with the majority of the health departments in their work in other cities. There are 37 separate bureaus or divisions for infant hygiene work, 15 having full-time medical directors.

2. Prenatal clinics are conducted in 73 cities. These are maintained by official agencies in 31 cities, by voluntary agencies in 32 cities, and by both municipal and voluntary support in 10 cities. The ideal of securing the registration at prenatal clinics of expectant mothers equal to 25 per cent of the number of births, on the average, is approached in only five cities for which this information was available.

3. Provision for the licensing and supervision of midwives in varying degrees is made in 52 cities by State regulations, in 10 cities by local regulations, and in 8 cities by both State and local regulations, while in 12 cities the practice of midwifery is illegal and in 4

cities there are no legal provisions. Information for the remaining cities is lacking.

4. It is gratifying to report a continuing decline in infant mortality rates in the majority of cities surveyed. In half the cities the infant mortality rate ranges from 48 to 80 deaths of infants per 1,000 births. Five have an infant mortality rate of over 110.

5. Infant welfare stations are provided in 94 of the surveyed cities, while in the remaining 6 cities infant care is given to a limited extent through home visits by nurses. In the majority of cities these infant welfare stations receive children of preschool age as well as infants under 2 years of age. In 40 cities infant welfare stations are provided by municipal agencies, in 40 by voluntary agencies, and in 14 by both municipal and voluntary agencies. Data for 59 cities show a total registration at clinics of 227,062 children, who made an average of 7.8 visits to clinic for each child. A total of 1,640,440 home visits were made by nurses in behalf of children of preschool age, or an average of 7.2 visits per child annually, or 63.6 visits per 1,000 population.

6. A study of the personnel provided for prenatal, infant, and preschool care indicates that the suggestion made in connection with the 1920 survey of the committee on municipal health department practice to the effect that there should be in cities of this size a division or bureau of child hygiene under a chief of the bureau is reasonable. To obtain the best results it is believed that one nurse should not have over 100 infants under observation at one time, while adequate medical service on a paid basis should be provided for prenatal and infant welfare clinics. The total cost of a complete service of prenatal, infant, and preschool care will range in different communities from 7 cents per capita to 10 cents per capita, exclusive of nursing costs.

IX. SCHOOL HEALTH SUPERVISION

A. Analysis and Discussion of Data

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RECOGNITION OF PROBLEM

Present-day American education has accepted the problem of promoting the health of school children. In fact, educators evidently recognize the need for physicians, nurses, and physical-education teachers to supplement the hygiene instruction of the classroom teacher. This recognition, starting with the employment of physicians to control communicable diseases in 1894, has extended to embrace many definite efforts for the present and future physical well-being of school children. In the survey by the Committee on Municipal Health Department Practice in 1920 and 1921 all of the cities over 100,000 population had developed some form of health supervision, except Dallas, where the schools were only visited on request to control infection. The same might be said for the 1924 survey, while among the smaller cities, between 70,000 and 100,000 population, Savannah alone had not developed some sort of organization for a school medical or nursing service.¹

We have further evidence of this recognition of the health problem among educators in the large prominence given to papers and discussions on this subject in all the professional meetings of educational officials as well as in their current literature. Furthermore, the report of the joint committee on health problems in education of the National Education Association and the American Medical Association in 1922 showed, among 282 cities, that only 3.9 per cent of

¹ The problem is not altogether unrecognized, however, in these two cities. In Dallas teachers are said to examine for vision and hearing in all elementary white schools three times during the school year. It was reported that they also weigh the children, but do not measure the height. Some children are taken to free clinics by teachers, and parents notified of the defects by written notices. They also provided 22 physical-training teachers, who were said to make physical inspections as well as to teach physical education. The parent-teacher association employed a nurse who "does some work in the schools," and another private agency established a child-guidance clinic that was reported to be doing good work along mental hygiene lines. An announcement in August, 1925, stated that a physician and 12 nurses had been employed for school-health service. Savannah provided a "health center," and the Council of Jewish Women conducted two demonstration schools for undernourished children. The city also provided physical-training activities by classroom teachers in elementary and high schools under the direction of a supervisor. Both cities provided for control of communicable diseases through the health department.

the cities were making no expenditures for health supervision or physical education. The average cost per pupil for such service was \$1.65 and the range of the average was from \$2.34 for the western cities to \$0.96 for the southern cities, while the median cost was \$1.37. Among 323 cities reporting on the question "How frequently is a pupil in your schools given a health and physical examination to discover defects that may be present?" only 4 per cent had no health or physical examination, and in 82.6 per cent of the cities reporting the school children were examined either by the school physician or school nurses, or both.

That public opinion has also recognized the problem is evidenced by permissive or mandatory laws² relating to school health supervision that have been passed in all but 13 States. Eighteen States have laws requiring school medical inspection for all school districts and 8 other States have mandatory laws for certain groups or with certain provisions, and 7 additional States have enacted legislation permitting school medical inspection. Thirty-three States have laws pertaining to physical education and 14 of these employ a State director or supervisor, while Minnesota has a superintendent of physical education and health education and Utah and Pennsylvania have a superintendent of health education. The importance of education in health or hygiene is recognized by laws requiring the teaching of hygiene or physiology in every State in the Union.

ORGANIZATION

Administrative control.—Among the 98 cities attempting a medical or nursing service in the schools in 1923, 23 cities had organized the work entirely under the direction of the health department and 57 cities had organized it under the education department. In the other 18 cities there were various kinds of joint arrangements between the health department and the education department. (See Table I.) In Philadelphia, Washington, and Minneapolis the education department paid for the service while the supervision was exercised by the health department. In the remaining cities part of the service was under the health department and part under the education department, as, for example, in Akron, Somerville, and Bridgeport, where dental hygiene was under the education department and the remainder of the service was supervised by the health department; while in Denver the service was supervised by the education department, and two part-time physicians for communicable diseases were under the health department.

² See Journal of the American Public Health Association for October, 1924.

TABLE I. *Organization of health service in public, parochial, and private schools, classified by department in charge, 98 cities, 1923*

Department in charge of health service in public schools	Cities with no health service in parochial or private schools			Cities with some (official) health service in parochial or private schools ¹			Cities with some health service in parochial or private schools, by nonofficial agencies			Total number of cities with school health service under specified supervision	
	Num-ber	Per cent	Key	Num-ber	Per cent	Key	Num-ber	Per cent	Key	Num-ber	Per cent
Health department...	3	13.0	HD. 1	20	87.0	HD. 2	0	0	0	23	23.4
Education department	28	49.1	ED. 1	23	40.4	ED. 2	6	10.5	ED. 3	57	58.2
Jointly by health and education departments	4	22.2	HED. 1	13	72.3	HED. 2	1	5.5	HED. 3	18	18.4
Total ²	35	35.7		56	57.2		7	7.1		98	100.0

¹ Additional service may be rendered by nonofficial agencies.

² Totals for 98 cities. See footnote, p. 256.

HD. 1.—Atlanta, Jacksonville, Portland.

HD. 2.—Baltimore, Buffalo, Cambridge, Chicago, Detroit, Fall River, Grand Rapids, Lawrence, Louisville, Lowell, Lynn, Manchester, Milwaukee, New York, Norfolk, Providence, San Francisco, Springfield, Waterbury, Worcester.

ED. 1.—Albany, Allentown, Bayonne, Birmingham, Duluth, Fort Worth, Hartford, Houston, Knoxville, Los Angeles, Nashville, Oakland, Oklahoma City, Paterson, Peoria, Reading, Richmond, St. Joseph, San Antonio, San Diego, Scranton, Tacoma, Toledo, Tulsa, Utica, Wichita, Wilkes-Barre, Youngstown.

ED. 2.—a. Parochial-school service under health department—Camden, Cleveland, Des Moines, Elizabeth, Flint, Harrisburg, Jersey City, Newark, Omaha, St. Louis, Sioux City, Somerville, South Bend, Syracuse, Trenton, Wilmington, Yonkers. b. Parochial-school service under education department—Erie, New Orleans, St. Paul, Seattle, Troy. c. Parochial-school service under both departments—Schenectady.

ED. 3.—Canton, Columbus, Fort Wayne, Kansas City (Kans.), Kansas City (Mo.), Spokane.

HED. 1.—Dayton, Evansville, Salt Lake City, Washington.

HED. 2.—Akron, Boston, Bridgeport, Cincinnati, El Paso, Indianapolis, Memphis, Minneapolis, New Bedford, New Haven, Philadelphia, Pittsburgh, Rochester.

HED. 3.—Denver.

NOTE.—For cities in italics practically the same service was rendered in parochial or private schools as was given in public schools.

As in the 1920 survey, health-department control prevailed in the first group of cities with Philadelphia and Pittsburgh working under a joint arrangement, while in the second group education-department control prevailed slightly with Denver and Washington working under both departments. In the smaller cities control by the education department was the more usual plan.

In 326 cities reporting early in 1922 to the joint committee on health problems in education of the National Education Association and American Medical Association there was a similar preponderance of cities with education-department control, the total being 72.7 per cent reporting education-department control, 12.3 per cent health-department control, 12.6 per cent by both departments, 1.2 per cent by private organizations, and 1.2 per cent no supervision.

Parochial and private school health service.—It will be seen from the headings of Table I that private schools have been included with the parochial schools wherever they are mentioned. It is impossible

to get an idea from the records as to how service in the private schools compares with that provided for public or parochial schools. Children from the better private schools usually have received medical service from private physicians so that many of their physical defects have been corrected. Where the health service in the public schools is very largely devoted to correction of physical defects, it is obvious that the demand for this service will not be urgent in such private schools. No doubt, however, many private schools are in need of the same health service as is offered in the public schools and it should be offered on the same basis wherever the private school authorities are sufficiently appreciative of its value to be willing to cooperate.

Fifty-six, or over one-half of the 100 cities, were giving some health service in either or both private and parochial schools. Some health supervision was given by nonofficial agencies in 7 other cities. Thirty-five cities were giving no such service.

If the service was organized under the health department, a child in a parochial or private school apparently had a better chance of receiving some health service, as will be seen from Table I, while of those 58 cities organized under the education department only 23, or nearly 40 per cent, had officially provided for parochial or private school service. Six other cities in this group meet this need through nonofficial agencies. Of these 23 cities with the public-school health service organized under the education department, most of them, 17, provided for their parochial schools through their department of health, while five cities reported that the same service was extended to the parochial schools. In Schenectady part of the service was rendered by the health department and part of it by the school board.

GENERAL DISCUSSION OF ORGANIZATION

Administrative control.—The relative merits of administrative control by the health department or the education department has provoked endless discussion with practically no progress toward settlement. Even if the national leaders in both public health and school administration could agree on what is an ideal organization, we should still have local public opinion, local traditions, municipal politics, State and municipal civil service laws, to say nothing of local prides and jealousies to consider before this approved administrative organization plan could be developed.

In the opinion of the writer the decision as to whether school health services should be placed under health-department or education-department control has generally depended more upon the immediate convenience of local situations than upon well thought-out policies of educational or health department administration. It will

be noted that more health departments direct the school service in the larger cities than in the smaller cities. It seems likely that this fact is explained by the better organization of the health departments in the larger cities when school health service was first demanded. The health authorities in these cities were the first to recognize the problem and therefore the school service was organized under their auspices. At a later period school authorities accepted the importance of the service and developed their own organizations in the smaller cities, where the health departments were less well organized or less progressive.

A solution of this controversy will not be attempted at this time, but the more important arguments on both sides will be considered. With the force of these arguments clearly in mind rather definite administrative policies may sometimes be determined in the light of the circumstances peculiar to any local community.³

Provision for private and parochial schools.—One argument often presented in favor of health-department control is that it is necessary in order to provide service to the private and parochial schools, for the reason that in many States boards of education may not legally expend public money in behalf of private institutions. In those cities where the education department administered the medical and nursing service for the public-school children in 1923, 60.7 per cent of the cities had no health service for the private or parochial schools, and of the cities giving cost data who had such an organization and were giving health service to the parochial-school children through the health department, all were spending considerably less per pupil for the parochial-school children than for the public-school children. (See Table IV.) This fact, probably, is significant as indicating the tendency to neglect the parochial-school group of children when a school health service is organized and to focus attention upon the public schools.

Obviously the force of the argument for health-department control is influenced in every city by the number of children attending private and parochial schools. It depends also upon whether health-department control permits the establishment of a cooperative relationship with the educational authorities so that such school activities as health education and physical education in the public schools may be properly coordinated with the medical and nursing service. Furthermore, it seems likely that a more general recognition of the health problem by the private and parochial school authorities will tend to promote health education so that these schools will not be dependent upon the official health department for leadership in corre-

³ See "Health for School Children." Report of the Advisory Committee on Health Education of the National Child Health Council, U. S. Bureau of Education, 1923, pp. 8 and 9, for discussion and plan of school health administration.

lating hygiene instruction with medical and nursing service. Where education-department control cares for the public schools, the health authorities might maintain the standard of medical and nursing service for the private and parochial schools with the gratuitous advice of the public-school health authorities. The experience of some cities in purchasing a nursing service from a private nursing organization suggests that a health department might secure nursing service from the public-school department for private and parochial schools.

All health service under one department.—Another argument favoring health-department control is the claim that efficient administration demands continuous records and service from prenatal and infancy advice up through preschool, school age, adolescence, and adult life. This claim presupposes that the health department should provide periodic health examinations and individual advice in preventive medicine and personal hygiene for all the population—a service that no health department has as yet attempted. The extension of this service apparently is looked upon as a logical future development because of the marked success of the infant and prenatal service in certain centers. But periodic health examinations and health advice for even this limited age group has never been extended throughout a city, and when it is so extended the place of the private practitioner in such a program must be carefully considered.

Periodic examinations of school children may take on the character of the thorough overhauling and health advice of the pediatrician, but even so it should be done as a demonstration or educational service and not attempted as an annual affair. When we consider such health examination service for the adult population, we meet the definite program that has been proposed to promote periodic health examinations by the private practitioner. Unless medical practice takes on a socialized character that is now usually considered of very doubtful practicability, the bulk of the individual advisory health service must be handled by the private practitioner as a paid service. Such a health service by the health department through all age groups would naturally be only an educational development with small groups, and therefore would not demand continuous service and records. The place that the bedside visiting nurse should play in the future development of preventive medicine is a problem that will be more apparent as public-health administration develops and the functions of specialized and generalized nursing service are differentiated. Thus, as more definite administrative trends are determined, we may better appreciate the function of the health department in a school health service.

Administration of nursing service.—The effective development of the nursing service is another important factor to be considered in

deciding the administrative control. The nurse who gains the confidence of a family through prenatal and infant care and advice, and especially one who administers definite bedside service in the home, gains a reputation in the neighborhood that tremendously extends her influence as a school nurse. To gain the cooperation of parents of school children regarding the correction of physical defects or to advise regarding diet or health habits is often a difficult or ineffective routine. But when the nurse has other resources in the neighborhood through the friends she has made or the confidence gained in other nursing activities, she becomes a family adviser who is relied upon in matters relating to the health and welfare of children. Infant, prenatal, and bedside nursing service, therefore, should strengthen the influence of the school nurse.

An organization providing for infant, prenatal, preschool, and bedside nursing as well as school nursing carried on by one nurse would be able, with the same personnel, to arrange for each nurse to serve a smaller territory and a smaller number of families than would be possible with specialized nurses for each age group and other nurses for bedside nursing. This more intensive community service, with more frequent visits in the homes, permits the nurse to become better known and appreciated for her service, and it tends to develop the nurse's reputation as a friendly helper. The generalized district plan of nursing has been acclaimed by some authorities on the ground that it prevents overlapping in the services that might be rendered under the so-called specialized plan. A further extension of a generalized nursing service in some cities includes the follow-up service for venereal diseases and tuberculosis cases and has included communicable disease.

Reasonable but probably not insurmountable objections have been raised to a generalized nursing plan that includes bedside and communicable-disease care. However, such a variety of nursing carried on by one nurse requires considerable training and experience. Some cities have endeavored to inaugurate the generalized program, but have been unable to extend it as they would like to because of a shortage of properly trained nurses. These cities feel that they can train a nurse to carry on the routine of school nursing or infant welfare or tuberculosis nursing much more readily than they can train a nurse to render effectively the several kinds of service. No doubt as the training of public-health nurses is given further recognition and nursing supervision becomes better developed, the organization of generalized nursing service will be more practicable. At least we shall recognize that good service must be based on a general foundation.

Generalized nursing or the conduct of school nursing by nurses carrying on other kinds of service requires either health-department

control over the school nursing or a well-defined cooperative relationship between health department and education department.

A correlated school health service under one head.—The correlation of medical and nursing service with health and physical education is another important problem to be considered in both the organization and administration of a school health program. Such a correlation should mean that the school curriculum should lead to the development of right attitudes toward health habits, periodic health examinations, control of communicable diseases—in fact, toward all public-health problems as well as an appreciation of medical science. If education is to develop such attitudes, there must be close teamwork between the teacher, nurse, physician, health and education supervisor, dental hygienist, dentist, the janitor, and the physical education supervisors, and likewise between the superintendent of schools and his supervisors and the health director. The fact that there are 18 cities with responsibility divided between the health department and the education department suggests that there is already some recognition of this need for close cooperation between the two departments.

A correlation of all the health aspects of the school program and at the same time a linking up of these activities with the wider community health activities calls for a broad type of administration and community cooperation. The advisory committee on health education of the National Child Health Council agreed that the director, to promote this correlated service, "should, first of all, be a person of administrative and organizing ability (a physician if available) who has had, in addition to a thorough general education, as much preparation as possible in hygiene, psychology, general principles of education, health education, and physical education."⁴ The need for this kind of training, as well as a thorough groundwork in public-health administration, is readily appreciated when we consider the scope of health service in the school and the problem of coordination with the community health activities that is briefly outlined on pages 6, 7, and 8 of the report just quoted.

Although a number of cities have health directors in schools, some of whom are more or less in charge of all phases of the health program, thus far these directors have not been able to correlate all the health aspects of the school curriculum. Fortunately, in individual cities we have excellent demonstrations of a coordination of some of the activities, but in none of the cities in the present survey do we find use made of all such school functions as health education, physical education, sports and athletics, school housekeeping and sanitation, mental hygiene, special classes, school lunches, school hours, the

⁴ See Health for School Children, p. 9, note at bottom of page.

print of textbooks, the organization of the curriculum, and medical and nursing service to promote the health of the child and to educate him along lines of personal and community hygiene.

We appreciate the possibilities of such a program when we see instances of health-education programs giving attention to the correction of physical defects, or to first-aid instruction correlated with actual demonstrations of care of accidents occurring in the school yard, or civics made practical through consideration of health-department regulations of communicable diseases that have occurred in the school, or the hygiene of communicable-disease control demonstrated by school regulations, or physical-education teachers motivating interest in health habits through the pupil's natural enthusiasm for physical prowess.⁵ Then, too, we have seen physical-education teachers making clear to the children that success in physical activities demands a strong, well-developed body, which is not obtainable unless the advice given by the physician at the regular physical examination is followed. The physical-education teacher who cooperates with the physician in the physical examination of the pupils in the upper elementary and high-school grades is a very potent force in making effective the advice of the physician. The correction of a physical defect obtained at the child's own instance is of greater value to the child than the immediate removal of the handicap through the exercise of parental authority, because the child who makes his own decision tends to develop an attitude of lasting value toward medical service.

If the physician is to give one or more pediatric physical examinations that consider more than the apparent physical handicaps, he should render individual advice regarding the kind and amount of exercise, rest periods, limitation of studies, or extracurricular activities as well as other health habits for children of subnormal physical resources. To carry out this advice the teacher's understanding of the pupil's physical status is necessary as well as the cooperation of parents.

The teacher who appreciates the health needs of her pupils, as the parent must understand them, can more nearly arrange the school curriculum to meet the individual needs of her pupils and emphasize health education to suit those needs. The health director through his staff of physicians, nurses, health education supervisors, and physical education directors must thus offer to the teachers and principals a wealth of suggestions for making school life contribute toward the health knowledge, habits, and attitudes of individual pupils. Of course, for the teacher of 35 or 40 pupils to individualize this educa-

⁵ The writings of Prof. Clark W. Hetherington, of New York University, have shown the value of utilizing the child's interest in physical activities as a motive force for training in health habits.

tional service is not an easy or simple procedure. Neither is it necessary that all problems of health education be made to fit each individual pupil, but each class has a few pupils that should have special consideration. Such cases as the high-strung, nervous child that tends to become overfatigued, the cardiac child, the child needing encouragement in taking corrective exercises, the child who wears glasses irregularly, and all children with crochets or those neglected at home and needing observation will profit greatly from the individual attention of the teacher. No doubt further improvement of school health service must consider more and more the individual health needs of individual pupils with the teacher gaining expert advice from the health education supervisor, the physical education teacher, the dental hygienist, the school nurse, and physician. With the further development of mental hygiene the psychologist, the psychiatrist, and possibly the visiting teacher would be consulted.

Such a correlation of the educational, medical, and public-health viewpoints in the school seems to be founded on sound principles of educational psychology as well as on good school administration practice, but its successful development will demand more attention to health education and normal growth, and physical development of the child in teacher-training courses. There has been an important recognition of this demand in the recent activities of the health education division of the American Child Health Association and in a few of the teacher training schools.

It is to be expected that a certain variety of forms of health organizations in different cities should be a stimulus to progress, because in this way a variety of experience results. But we should be able to agree that the supervision of school health service must be worked out with full recognition of the demands of educational health activities, and this involves the kind of leadership recommended by the National Child Health Council and a definite cooperative relationship between health and school authorities.

EXPENDITURES

The methods of cost accounting both in health departments and in school departments vary so widely in different cities that we are inclined to question the comparisons of any cost per pupil calculations until more uniform financial records are available. However, of the 100 cities studied, 66 cities have been selected with apparently dependable records of medical and nursing service. The costs were reckoned so as to eliminate physical education and health education expenditures, and the cost of maintaining special classes, except for salaries and expenses of nutrition or other health supervisors of

special classes. The expenditures of nonofficial agencies were included if definitely a part of the medical, dental, and nursing service, or if expended for health supervisors of special classes. The cost of clinic service—e. g., dental, or eye, ear, nose, and throat—was included if definitely organized as a part of the school medical or dental service, but expenditures for permanent or semipermanent equipment were not included. Except for dental corrections, most of the clinical service, however, was organized as a separate division of government or charity. Free milk given to undernourished children by an official agency was included in the total cost. The cost of parochial-school service was included with the public schools if the service in both types of schools was under the same supervision, even though, as in some cities, the service was not the same in the parochial schools as in the public schools. The unit cost was computed on the basis of the school enrollment that was served except that the high-school enrollment was included without regard to whether service was rendered in the high school or not. It should be noted, however, that it is a common practice to limit the service to elementary-school pupils.

TABLE II.—*Expenditures for school medical and nursing service in 66 cities, classified according to the department controlling the service, 1923*

Conducted by—	Service given to—	Number of cities	School population of cities included	Average cost per pupil for cities of this classification, per annum
Department of education.....	Public schools only.....	38	1, 279, 305	\$0. 986
Do.....	Public and parochial schools..	1	21, 936	1. 230
Department of health.....	do.....	20	2, 453, 693	. 672
Departments of education and health.....	do.....	3	133, 568	. 493
Do.....	Public schools only.....	4	222, 740	1. 237

Among the 66 cities considered in Table II there were 38 cost per pupil figures recorded for public schools only under education-department supervision. One of these cities gave nursing service to the parochial schools through the department of education and supplied physicians through the health department. One city under education-department control gave service to both public and parochial schools. In 20 cities the service was under health-department supervision and the service was reckoned for both public and parochial schools for all these cities. Seven other cities had joint control under both the health department and the education department, three of these providing service to both public and parochial schools, and four only to the public schools.

It will be readily seen from Table II that under education-department administration the cost per pupil expenditures is considerably higher than the average for health-department control. In the report of the committee for the year 1920⁶ it was also noted that education-department control resulted in larger expenditures, but some of the figures used in that report included activities not embraced in the health-department costs, such as physical education. Furthermore, this difference in cost may have been influenced to some extent by the overhead that was carried in some cities by the Bureau of Child Hygiene or other health-department bureaus.

TABLE III.—Expenditures for school medical nursing service in 66 cities, classified by population groups, 1923

Population groups	Number of cities	School enrollment	Expenditures	
			Total for school health supervision	Average cost per pupil per annum
Group I.—500,000 and over.....	8	2,301,410	\$1,242,293.22	\$0.539
Group II.—250,000 to 500,000.....	13	794,009	675,708.69	.850
Group III.—100,000 to 250,000.....	31	818,272	723,976.54	.884
Group IV.—70,000 to 100,000.....	14	233,051	213,118.95	.914
All cities.....	66	4,146,742	2,855,157.40	.688

In Table III it appears that the cost per pupil is in inverse ratio to the size of the city when classified in population groups. This difference in cost between the population groups is considerably greater than in the previous report for 1920.

There were nine cities included among those having health supervision in public schools under education-department control who gave service to the parochial schools through the health department. The cost data for the parochial schools in seven of these cities is computed separately in Table IV.

TABLE IV.—Expenditures for health supervision in public and parochial schools in seven cities having services conducted by different departments, 1923

Cost per pupil in public schools under department of education, per annum		Cost per pupil in parochial schools, under department of health, per annum	
City	Amount	City	Amount
Syracuse.....	\$1.84	Syracuse.....	\$1.55
Jersey City.....	1.65	Jersey City.....	1.35
Trenton.....	1.61	Trenton.....	.85
Des Moines.....	1.60	Des Moines.....	.75
Yonkers.....	1.35	Elizabeth.....	.74
Omaha.....	.94	Yonkers.....	.65
Elizabeth.....	.85	Omaha.....	.60

NOTE.—The other two cities with separate services for public and parochial schools gave insufficient data for parochial-school costs so that the cost per pupil could be determined only for the public schools.

⁶ Public Health Bulletin No. 136.

Figure 4 shows the frequency distribution of cost per pupil. The expenditures range from 23 cents to \$2 per pupil. Only 9 cities, or 13.6 per cent of the 65 cities reporting, spent \$1.40 or over per pupil per year. Twenty-three, or 31.8 per cent of the cities, spent \$1 or more per pupil. All these expenditures are apparently higher than those recorded for 1920 in the previous report, and it seems likely that this is a true increase because current reports and contacts seem to show this tendency. With an increase in expenditures we have added reason for school-health record keeping that will measure efficiency to at least some degree.

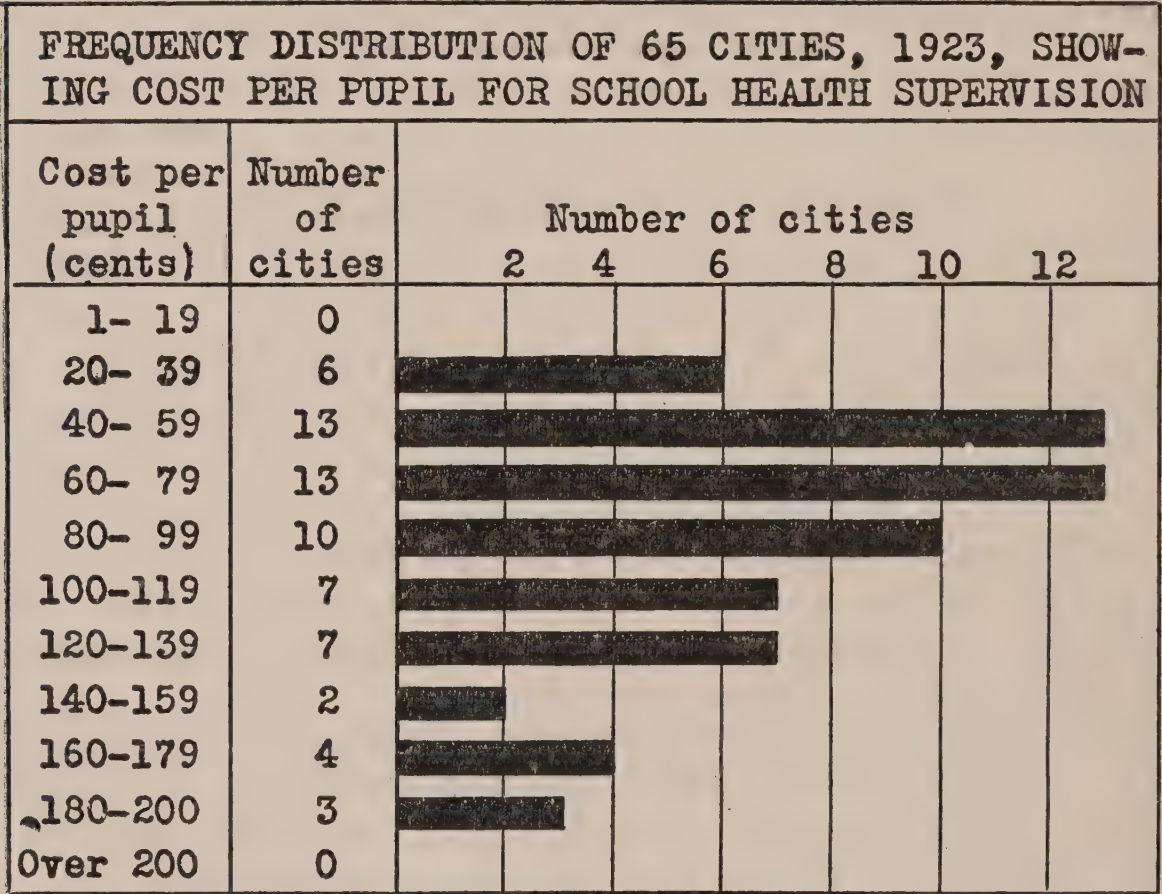


FIG. 4

GENERAL DISCUSSION OF EXPENDITURES

There are very few cities expending a sufficient amount to provide a service that meets any of the standards recommended by students of the problem. (See report of National Child Health Council, Health for School Children, 1923.) No more valuable contribution could be rendered at this stage of our progress than a careful analysis of the cost, procedures, and organization of a selected group of cities that are now giving a fairly satisfactory service. It would then be possible to consider progress in terms of cost and determine what constitutes a reasonable expenditure. With more accurate

and more uniform cost accounting records, many economies in school health service might be demonstrated. In fact, without such cost data the value of our efforts can not be expressed in terms the taxpayer can readily understand.

Prof. J. R. McGaughy, of the Department of Educational Administration of Teachers College, New York, who has given a great deal of study to educational finance, recommends for cities between 100,000 and 300,000 population an expenditure of \$2 to \$2.50 per pupil in average daily attendance, a figure greatly in excess of the amount provided by any city in the group under consideration. Doctor McGaughy found in 1921-22 an average cost of 87 cents per pupil in average daily attendance in cities of 50,000 to 100,000 population. Dr. Thomas D. Wood recommends 5 per cent of the total sum available for education. Unfortunately for our purpose, Doctor Wood's data on the cost in over 300 cities in the report of the joint committee on health problems in education includes physical education, which is frequently a large item.

MEDICAL STAFF

Directors.—All but 6 cities in the present group employed physicians for school health service. Ninety-one cities had directors of the school health service, and 3 other cities, which employed physicians, assigned the responsibility of direction to no one person. Fifty cities, or nearly 55 per cent of the cities employing physicians, had full-time officials in charge, while 41 cities employed part-time officials as directors. Wherever the service was conducted by the health department there was a tendency to place it under the direction of the health officer or some bureau chief who administered the school work as a part of his other duties, with no full-time director of the school activities. Seventeen cities had their school service administered by such a full-time official of the health department, 9 of these being directed by the health officer,⁷ 5 by the director of child hygiene, and 3 by some other official of the health department. Only 3 cities under health-department administration had a director giving full time to the school health service. Under the department of education 20 cities had a full-time director and 29 cities had a part-time director. Eight cities had a full-time official giving part time to school work under a joint arrangement between the departments of health and education, 4 of these being health officers, 1 a chief medical inspector, and 3 were directors of child hygiene. Two cities, under a joint arrangement, had full-time officers in charge of school

⁷ In Fall River in 1923 the health officer was not a physician, but there were physicians on the staff. Since this survey, however, a full-time physician has been placed in charge of the work under the health department.

work and 4 had part-time men. The remaining 8 cities had a part-time director under the department of health.

TABLE V.—*Directors of school health service in 91 cities, 1923, grouped by department having supervision*

Health service conducted by—	Service of director	Number of cities
Education department.....	Full-time.....	20
Health department.....	do.....	3
Education and health departments jointly.....	do.....	2
Health department.....	Part-time to school, but full-time officials.....	17
Education and health departments jointly.....	do.....	8
Education department.....	Part-time.....	29
Health department.....	do.....	8
Education and health departments jointly.....	do.....	4

It will readily be seen that school health supervision in 20, or 71.4 per cent of the 28 cities under health-department control, had the advantage of a full-time directing official, while 20, or 40.8 per cent of the cities with education-department supervision, and 10, or 71.4 per cent of those having joint health and education department control, were directed by full-time officials. These data seem to indicate that health-department or joint health and education department control results in a larger proportion of cities employing a full-time official to administer the school service, although exactly one-half of them devote only part of their time to school work. However, the fact that there is a smaller proportion of full-time officials under education-department control should not be considered as evidence that school health service can not be administered to advantage under the supervision of an education department. Further discussion of administrative control will be found in the foregoing discussion of organization.

Staff physicians.—There were 15 cities with only one physician for all the school work, six⁸ of these physicians being part time and nine⁹ full time. Six cities¹⁰ employed no physicians, but this number includes Dallas and Savannah where there were also no nurses. It is evident, therefore, that 19, or nearly one-fifth of the 100 cities, relied very largely upon the nursing service for the detection of physical defects, and in four cities there was no check upon the nurses' work other than that exercised by private or clinic physicians.

St. Louis had a full staff of 15 whole-time physicians, while Kansas City, Mo., and Seattle each employed two full-time physicians. Fifteen other cities employed one or more full-time staff physicians, but for the most part the work was handled by part-time physicians engaged in private practice.

⁸ Wilmington, Albany, San Diego, San Antonio, Harrisburg, Omaha.

⁹ Fort Worth, Houston, New Bedford, Tulsa, Canton, Peoria, St. Joseph, Spokane, Tacoma.

¹⁰ Kansas City, Kans., Sioux City, Wichita, South Bend, Savannah, Dallas.

TABLE VI.—*Number of cities employing different types of medical service of school health supervision, 1923*

Director	Staff physicians	Number of cities
None.....	None.....	1 6
Part time.....	do.....	2 6
None.....	Part time.....	3 3
Full time.....	None.....	4 9
Do.....	Full time.....	5 3
Full-time official but only part time to school work.....	Part time, and with 1 or more full-time physicians in 7 cities.....	6 25
Full time.....	Part time, and with 1 or more full-time physicians in 3 cities.....	7 13
Part time.....	do.....	8 35
Total.....		100

¹ Dallas, Savannah, Kansas City (Kans.), Sioux City, Wichita, South Bend.

² Albany, San Diego, San Antonio, Youngstown, Harrisburg, Omaha.

³ Knoxville, Hartford, Wilmington.

⁴ Fort Worth, Houston, New Bedford, Tulsa, Canton, Peoria, St. Joseph, Spokane, Tacoma.

⁵ St. Louis, Kansas City (Mo.), Seattle.

⁶ Buffalo, Chicago, Cleveland, New York, Pittsburgh, Cincinnati, Indianapolis, Louisville, Minneapolis, Rochester, Washington, Akron, Atlanta, Bridgeport, Dayton, Fall River, Grand Rapids, Jacksonville, New Haven, Providence, Worcester, El Paso, Lawrence, Manchester, Waterbury.

⁷ Los Angeles, Philadelphia, Denver, Milwaukee, Camden, Erie, Flint, Lowell, Memphis, Richmond, St. Paul, Trenton, Schenectady.

⁸ Baltimore, Boston, Detroit, San Francisco, Columbus, Jersey City, Newark, New Orleans, Portland, Toledo, Birmingham, Cambridge, Des Moines, Duluth, Elizabeth, Lynn, Nashville, Norfolk, Oakland, Oklahoma City, Paterson, Reading, Salt Lake City, Scranton, Springfield, Syracuse, Utica, Yonkers, Allentown, Bayonne, Evansville, Fort Wayne, Somerville, Troy, Wilkes-Barre.

NOTE.—Cities in italics have one or more full-time physicians as well as part-time physicians on the staff.

Table VI indicates that the general tendency was to employ a part-time staff of physicians with a whole-time or part-time director. More recently there has been an attempt to place the work altogether upon a whole-time basis by employing one physician on full time and then depending on nurses for most of the examinations for defects.

GENERAL DISCUSSION OF MEDICAL STAFF

The advantages of a director of all the school health activities have been discussed under the previous section. Under health-department supervision there is some tendency to organize the school work under a director who has other health-department duties than those relating to school children. This plan has the advantage of affording a full-time official with more effective supervision than should be expected from a physician engaged in private practice, but it often happens under these conditions in the larger cities that the school service does not get the supervisory attention that it deserves. The work may be fairly well organized, but the other executive duties of an official in a large department do not permit proper supervision of the staff unless supervisors are also employed.¹¹ The part-time physician and the nurse inadequately

¹¹ The writer has seen part-time directors in a few cities who have been able to organize and direct health programs in a commendable manner, but no doubt in these cities larger returns could be obtained by full-time direction and adequate supervision.

trained in public-health duties are frequently much in need of competent supervision.

A city with a full-time medical director who has as his assistants a staff of nurses with special training in the detection of physical defects and normal diagnosis no doubt has some advantage over those cities with all part-time physicians, but in cities as large as those in this group such medical directors necessarily have little time for supervision and correlating the service with the other health activities in the schools. Under such conditions the work of the nurses must be left to the direction of a nursing supervisor often with insufficient correlation with the work of the physicians; special classes, health education, and physical education must develop as separate activities; in fact, such a health director without a medical staff must be bound altogether too closely to routine physical examinations.

The director, therefore, should have a staff of full or part time physicians to assist in routine examinations so that the director (or his assistant in the larger cities) may give his time not only to promoting all the health activities of the school but to helpful supervision of the medical staff in order to maintain high standards of service and to assure the most effective use of time of all members of the staff. Without such direction the tendency of any large staff is to follow a routine with efforts directed more toward the accomplishment of the routine procedures than toward the largest interest of individual children. The character of the examinations, the advice to the parent at the time of the examination at the school, the advice to the nurse and teacher so that they have an intelligent understanding of the condition of the pupil, are all phases of the service that usually need much supervisory attention unless the staff is unusually competent.

The use of full-time staff physicians in a school service has not been tried extensively. No doubt such physicians more readily fit themselves into the organization and plan of the health program and generally acquire a better point of view toward the work, but it is not always easy to offer salaries sufficiently remunerative to attract and hold competent men. The use of part-time physicians with an interest in pediatrics or clinical medicine should result in a satisfactory service under proper supervision. Definite hours and a salary sufficient to make the position an inducement to capable young men are also important factors.

The ratio of pupils to physicians needed depends upon the frequency of the examinations, the thoroughness and time of the examinations, time given to the service, and the organization provided to relieve the physician of records and all other routine duties that might be handled by the properly trained nurse or teacher. Prob-

ably a part-time physician giving 12 to 15 hours per week could render fairly satisfactory service to 4,000 or 5,000 pupils, provided the nursing assistance was adequate.

SPECIALISTS

A few cities in 1923 reported the employment of specialists in connection with their school medical service. Eight cities mentioned a psychologist on part time, and San Diego and Boston mentioned a psychologist on full time. Los Angeles reported two men on the regular staff who were especially trained in psychiatry.

Baltimore and Milwaukee each reported the employment of a part-time eye, ear, nose, and throat specialist, and Lawrence and Akron each mention one similar part-time specialist.

Detroit, Elizabeth, Providence, Scranton, and Bayonne each reported the employment of two part-time oculists, and New Orleans and Schenectady both mention the employment of one part-time oculist.

New Orleans, Schenectady, and Detroit reported the employment of orthopedists, and Detroit also employed an oculist dealing only with children handicapped with eye defects and another specialist dealing with ear defects.

GENERAL DISCUSSION OF SPECIALISTS

The use of the specialist in a school health service has not been thoroughly developed. Considering the problem of physical defects from the standpoint of advising parents that the condition of their child can be improved through medical or surgical treatment suggests the need of specialists in cases where the physician with general training is in doubt as to the possibilities of treatment. For example, many parents accept serious orthopedic defects as incurable and are not easily persuaded to seek the advice of the orthopedist unless assured definitely that there is a fair prospect of correction or improvement. The examination of the orthopedist is often necessary to point out to the parents what might be done for the child. Deaf children are also frequently neglected when special treatment would prevent the aggravation of the condition, but the general physician is not always able to differentiate between the cases offering a good prognosis and those not likely to respond satisfactorily to treatment. The mentally defective and the unadjusted or behavior-problem child most certainly need the advice of the specialist, and it is just being recognized that it is good school economy to employ specialists for diagnosing these conditions. Proper mental hygiene demands further that the teachers and parents be advised as to the management of these cases.

The selection of cases for special classes should be made only after a prognosis has been obtained in order that the children most in need of the work of the special classes can be selected. A correct prognosis, of course, demands an accurate diagnosis, and many of the candidates for such special classes as "sight saving" and "lip reading" will thus profit by the specialists' examination to determine whether or not treatment might be effective. An accurate diagnosis of mental defect for placement in special classes for retarded pupils is an essential, and Massachusetts was led to face the problem largely through the efforts of the late Dr. Walter E. Fernald, and now that State is making excellent provision through its traveling clinics. The occasion for other special classes suggests the need for a thorough consideration of the place of the ophthalmologist, the otologist, and the orthopedist on the school medical staff.

The examination of the eyes for the detection of those conditions not recognized by the simple visual acuity tests will probably lead to the employment of eye specialists as the school service develops. No doubt many cases of eye strain are undetected to-day by failure to recognize far-sightedness or astigmatism by the Snellen test. Students at the College of the City of New York, under the direction of Dr. Thomas A. Storey, are examined by a specialist with the skiascope, without a mydriatic, combined with the usual visual acuity test.

PHYSICAL EXAMINATIONS

Fifty-three, or over one-half, of the cities now being considered gave a physical examination as frequently as every year in all grades. This number includes seven cities that reported two physical examinations every year, but in only two of these cities were all the examinations made by physicians. Nine other cities reported as many examinations in the school career as one every other year or more frequently. Twenty-two cities gave two or more examinations during the school career. Thirteen cities did not give sufficient data for tabulation. It was a common practice to examine all children in certain grades every year. Oakland reported two examinations yearly in the first and fifth, or sixth and ninth grades. Some cities gave additional examinations for communicable disease. Others reported additional examinations for special cases.

Probably these examinations were for the most part merely for the detection of the grosser physical defects. Only 32 cities reported a physician's examination including heart and lungs with the clothing either partly removed or loosened. In two of these cities the clothing was removed only from the boys, 10 cities reported that the clothing was only partly removed, and two reported that clothing was only loosened. Nine other cities stated that the physician ex-

amined the heart and lungs but the clothing was removed only in special cases or when the parents were present. Twenty-two additional cities reported on heart and lung examinations by a physician but specified that no clothing was removed.

Of course an examination of the lungs through the clothing is of little value and under the best of conditions the school physician will rarely do more than refer a very few cases suspicious of tuberculosis to the family or clinic physician. In the experience of the writer different claims are made by school physicians as to the value of the heart examination through the clothes. Probably it could be agreed that at least part of the more serious heart conditions could be suspected without removal of more than the outer clothing.

Among the 57 cities with part-time school physicians there was an average of one physician to 6,048 pupils. The writer would expect from the work he has seen in some of these cities, considering the number of pupils per physician and the time usually given by the physicians, that the tendency would be for such rapid examinations that anything approaching a thorough report on the child's physical condition would be impossible. In fact, it seems generally safe to assume that the examination is designed more to detect the handicapping physical defects than it is to form a basis for advice as to all the needs of the child to attain its greatest measure of health and development.

Apparently very rarely are the parents present at the examination. From only 48 cities was there any answer to this inquiry that indicated that parents ever came or were allowed to come. Five cities apparently made a definite effort to have parents present for the examination of certain special groups of children such as those in the nutrition or open-air classes. A few cities invite the parents or notify them or occasionally send for the parents so that a more thorough examination may be made, but as far as can be learned no city has worked out a definite policy of educating parents in the value of periodic health examinations by physician-parent conferences.¹²

The reports of the examinations were not sufficiently complete to gain satisfactory information regarding the results obtained. However, the wide variety of proportions of tonsil defects found among 49 cities suggests either wide differences in the character of the examinations, or in agreement as to what constitutes a tonsil defect, or else some cities have very few tonsil defects. (See fig. 5.) No doubt a continued program over a number of years has resulted in the correction of numerous tonsil defects in some cities, but it does seem

¹² Excepting Trenton, where special efforts have yielded excellent results in a few schools and possibly Oakland. (Toronto reports that over 50 per cent of the parents attend the examinations.)

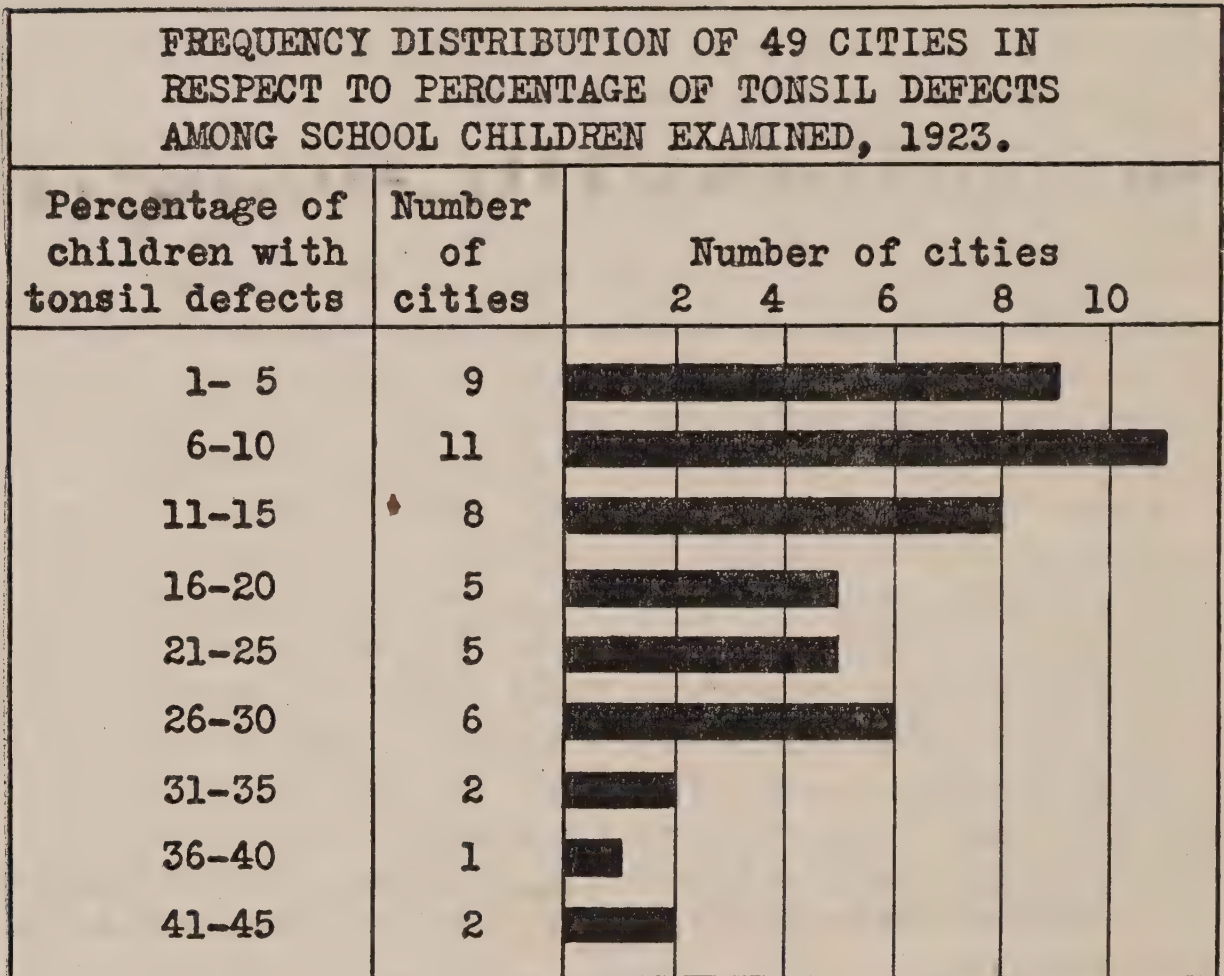


FIG. 5

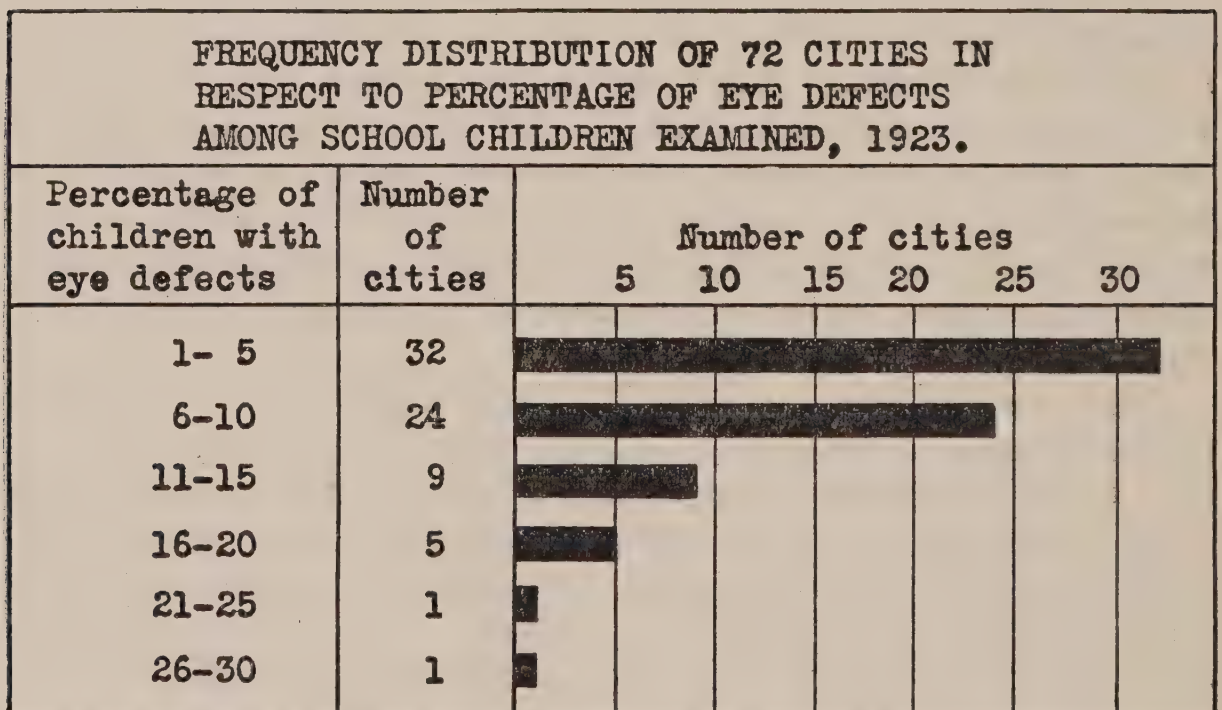


FIG. 6

likely that the variation in percentage of tonsil defects reported in a number of these cities is more the result of differences in examination than such a wide difference in the actual number of children with tonsil defects. The frequency distribution of the eye defects (see fig. 6) indicates less variation, possibly due to the fact that the visual acuity test is a fairly standard procedure. Even here there is room for improvement as to agreement in regard to what is a defect. It is doubtful if the two cities reporting between 20 and 30 per cent eye defects have children with eyes so very different from the 32 cities with only 1 to 5 per cent defective. It is suspected that there is both a difference in the conditions under which the children were examined and a difference in type of condition recorded as a defect.

GENERAL DISCUSSION OF PHYSICAL EXAMINATIONS

The report of the health education conference¹³ held by the American Child Health Association in Cambridge (1924) states that "the aim of the health examination of the child is to provide for every child a chance to achieve the limit of his endowed capacity for well being," and, further, that the function of the physicians should be:

1. To provide guidance toward better health through education of the children.
2. To provide an examination service which (a) discovers all physical defects, diseases, incipient conditions, and tendencies toward ill health among school children, and (b) finds sources for remedy.

The statement further adds that the function of the teacher and parents as participants should be:

1. To be present at the examination and to supply information relative to history and habits of the child.
2. To secure the cooperation of the children through class and individual instruction.
3. To stimulate and secure correction of physical handicaps.

Thus far we have had very little administrative experience with these comprehensive aims and functions of school physicians. To provide an examination that detects the more serious physical defects and provides guidance toward better health through education of the children to an appreciation of the importance of these defects represents about the limit of the present examination service in most cities.

If we are to approach such a lofty aim as to provide for every child a chance to achieve the limit of his endowed capacity for well-being, we must, no doubt, develop the functions of school physicians,

¹³ See Report of the Health Education Conference in Cambridge in June, 1924, conducted by the health education division of the American Child Health Association and the department of biology and public health of the Massachusetts Institute of Technology.

teachers, and parents as above outlined. It is not surprising, however, that certain features of that development have been neglected in meeting the urgent demand for discovering the large number of correctable handicaps that need immediate attention. Apparently the theory that these examinations should be made annually or the desire to profit from the examination procedure by frequent repetition has obscured the method of obtaining these objectives. Thus, we not infrequently find the examinations repeated without adequate efforts toward the amelioration of the findings of these examinations. Furthermore, the frequent repetition of the examinations, with the consequently overrapid technique of examining, has led to an emphasis upon only the outstanding physical defects and a neglect of the educational features for both the parent and the child. This emphasis, merely recording the physical defects, has not made the most of the physician's influence in obtaining the correction of the physical handicaps, because the big demand for examinations and the recording of defects has left the responsibility for corrections too heavily upon the nurses. In other words, the physician's responsibility has been more to discover defects than to participate in the educational activities to improve the health of the child.

In any plan of school health service consideration must be given to providing the largest service to the greatest number. We must therefore consider that practical administration will not permit the kind of thorough-going examination and educational service recommended in the aims stated above for all children. First, thought must be given to the immediate needs, and therefore we must discover the condition and advise parents regarding the more outstanding defects that are generally recognized as needing immediate attention before we attempt to correct all the incipient conditions and tendencies toward ill health that should properly be considered in the thorough pediatric examination.

This practical first consideration of the immediate needs suggests two types of examination: First, a fairly rapid recording of the more important physical handicaps of all the children with notices to parents and follow up by the nurses; and, second, a thorough pediatric examination with the parent and teacher present, considering the history and habits of the child, demonstrating the value of a periodic health examination, and advising the parents in an educational way as to their share in maintaining and promoting the health of the child.

The first type of examination should be given about four times in the school career of 12 years or three or four times in the career of those children not attending high school. This examination should be supplemented by the educational features of the parent's

consultation with the school physician when the condition of the child or the response of the parents warrants it. The emphasis, therefore, would be placed upon those children with serious physical defects in order to observe the condition of the child and to impress upon the parents the need for attention.

The second type of examination might be planned for only once or twice in the school career of the child unless the program is sufficiently developed and funds are available to carry on the more advanced program. Where the problem of correcting the more serious physical defects is large, private health agencies should support the official activities by providing this more thoroughgoing analysis of the child's health and use this examination as an educational force to promote periodic health examinations. A parent's consultation with the school physician at one of these pediatric examinations would have its educational effect in promoting a clearer understanding of the health activities of the school and of the importance of correcting the physical handicaps reported to them as a result of the first type of examination. In this way the pediatric examination, offered at least once during the school career, would supplement the more rapid examinations by developing the educational features of the health examination, and thereby cultivating right attitudes on the part of the pupils and parents toward the work of the physicians and nurses.

DENTAL SERVICE

Of the 78 cities in the first three groups, 63 cities employed dentists in 1923. In 24 instances some or all of them were full-time employees. In this group, for 1923, nine more cities employed dentists for school service than were reported in 1920. Among the cities between 70,000 and 100,000, in 1923, there were 20 cities employing dentists, some or all of them on full-time basis in five instances. Thus, of the 100 large cities, 83 provided dental service in 1923.

In the 21 cities where all the dentists were on full time there was an average of 1 dentist for 20,703 pupils. Allentown and Dayton employed 1 dentist to 6,130 and 6,142 pupils, respectively.

Twenty-six cities reported the employment of one or more dental hygienists or "dental nurses" and eight cities reported dental assistants or dental aids. However, these figures may not represent all the cities employing dental hygienists or assistants to the dentist, as the questionnaire did not specifically mention these workers. Two cities reported dental inspectors and one city reported a dental supervisor.

The fact that the school health service was organized under the health department or under the education department apparently had not influenced any cities to develop a dental service, as about the same proportion of cities had established this service under each kind of organization.

No exact data were obtained to indicate who examined the teeth, but such contact as the writer has had with various cities has shown physicians, nurses, teachers, dental hygienists, and dentists all participating in this duty. Figure 7, showing the percentage of teeth defects found in 75 cities, suggests that a large proportion of the cities made examinations that detected only the more serious dental

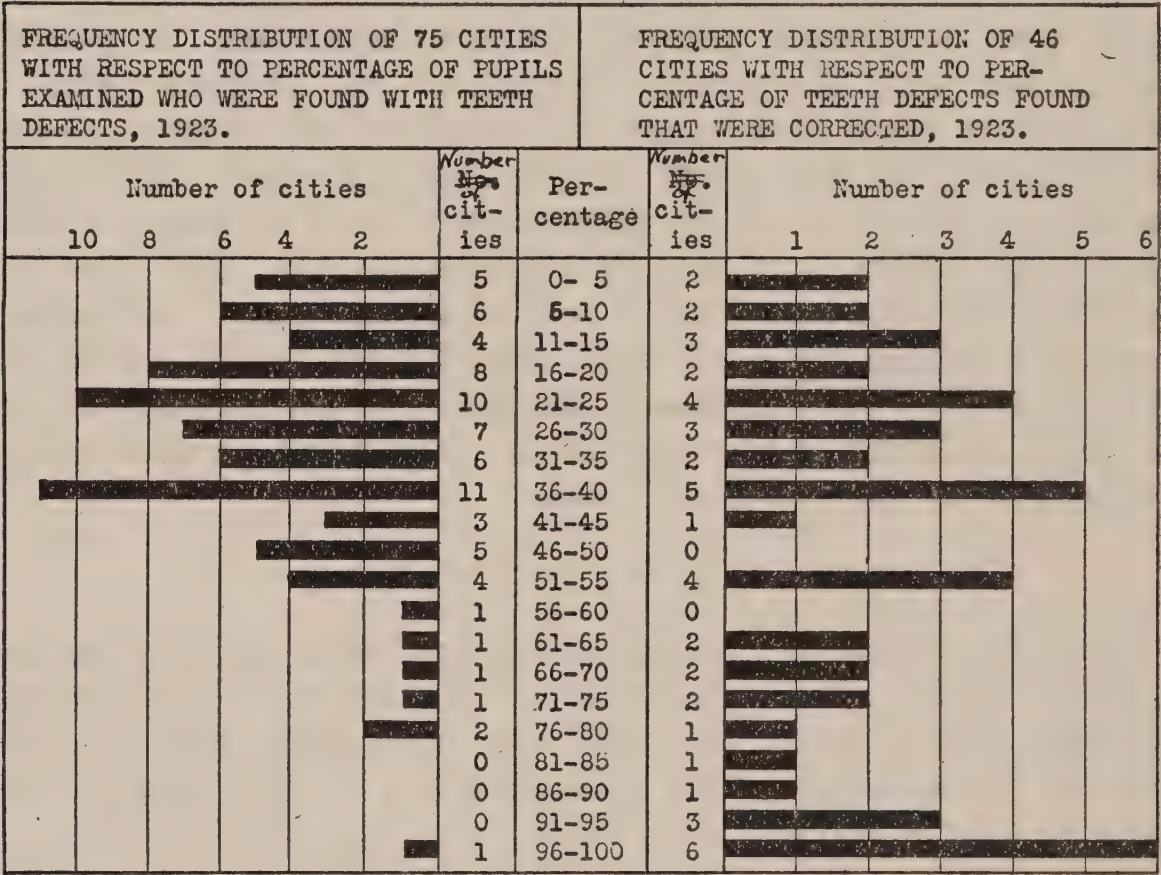


FIG. 7

defects, because careful examinations by a dentist or dental hygienists usually reveals many more than 40 per cent of the children with defects needing attention. It will be noted that nearly one-third of the cities reported 20 per cent or less of the children with dental defects.

Judging from the percentage of corrections reported in 46 cities (fig. 7), there was a wide variation in the amount of correction work undertaken in these cities. Of course, the percentage of corrections may have been large in some cities, because the number examined was not much greater than could be handled in the free clinics. The dental clinic facilities in a few cities were very extensive and handled a large amount of work.

GENERAL DISCUSSION OF DENTAL SERVICE

There has been a very general recognition of the need for school dentists and, more recently, dental hygienists, but apparently the question of whether the service should be a charity or an educational service has not been considered thoroughly from the standpoint of public policy by many of the cities. There has been a definite tendency to offer prophylactic and corrective dental service as a charity to those unable to pay, but this offer has been rather more liberally interpreted than the medical or surgical services in the same cities. Probably many pupils have received dental service at the school or free clinics who would have been referred to private service if they presented themselves to a free clinic for medical service. The dental profession has possibly condoned this practice because of the educational value of the school dental clinic.

The practice has grown up in a number of cities of charging pupils a nominal sum for fillings and other corrective service. This practice has been explained as an attempt to prevent pauperization of the children and in some places to cover the cost of materials. The extension of this practice to meet the demand of a proper health-education program would probably bring the clinic into competition with the private dentist. To offer the service only to indigents who are unable to pay for any care would tremendously limit the educational value of seeking the advice and services of a dentist. In fact, the advocate of a free service given as a charity faces the dilemma of educating children in wrong attitudes toward charity service or limiting the service only to the deserving and thus failing to inculcate proper attitudes toward periodic cleanings and examinations for dental caries. Modern education is just coming to recognize the importance of attitudes in education. Education in wrong attitudes may be as effective as education in right attitudes in so far as results are concerned. The child who is taught to look lightly upon accepting charity dental service is not likely to scorn charity dental or even medical services as he grows older, even though he may be able to pay for diagnosis and treatment.

Dr. Alfred C. Fones, of Bridgeport, in his new book on Preventive Dentistry, states that "it is no more right to provide dental service for one class than to provide textbooks or pencils for the poor and not the others." He advocates and has carried out in Bridgeport a policy of prophylactic service in the first five grades that "is educational and preventive service which all children are entitled to in the grades worked in." In a letter to the writer he gives the plan for the dentists and dental hygienists as follows:

1. Prophylactic treatments and examination of mouths for all children in grades one to five. (Dental hygienists.)

2. Toothbrush drills and classroom talks regarding diet and general hygiene. (Dental hygienists.)
3. Filling of fissure cavities to preserve six-year molars in grades one and two, when these teeth first erupt. (School dentist with portable equipment.)
4. Extraction of abscessed deciduous teeth for children of any grade. (School dentists.)
5. Relief of pain for children of any grade. (School hygienists.)¹⁴

This plan definitely faces the problem of an educational service and then provides such actual charity as is needed after the fifth grade for those who must have free service. The only other way that this educational service can be promoted is to urge parents to take their children to private dentists for prophylactic service, examinations, fillings, extractions, and orthodontia, and, when not successful in impressing parents regarding the importance of this care, then free care must be offered or the child's teeth neglected.

The apparent attitude of altogether too many parents at the present time is indifference toward dental care. They are willing to accept it if it is provided as a part of the child's schooling. A generation of education in proper attitudes toward care of the teeth should result in a better appreciation, on the part of parents, of the importance of dental care sufficiently to respond to a report indicating the need of a careful examination. The writer, therefore, favors the Bridgeport plan from the standpoint of a definite educational service for a limited number of the early years of school life combined with prophylactic and limited corrective treatment during those years.

Parents desiring to employ private service in lieu of the school dental service should exercise this privilege, but the school service should be provided for its educational value to all children after the manner of other educational services. The value of this plan is evidenced by the Bridgeport experience where, during the first five-year period of its operation, the incidence of dental caries in the permanent teeth of fifth-grade statistical children was reduced 33.9 per cent, and the number of fifth-grade children who had lost their six-year molars was reduced from 15.1 per cent in 1915 to 7 per cent in 1920.¹⁵

There is some difference in the thoroughness and time given to each prophylactic treatment in different cities and the extent of cooperation by the teachers in education regarding dental hygiene, but it seems not too much to expect that one dental hygienist should be provided for every 1,000 children in the grades served, and 15 hours per week for dental corrective work on a similar number of

¹⁴ Considering the service strictly on an educational basis only, to initiate care of the teeth among all children, relief of pain should be only in the form of first aid combined with follow-up to educate parents of children as to how the painful conditions might have been prevented and to obtain the proper corrective service.

¹⁵ See "Preventive Dentistry," by Alfred C. Fones, D. D. S.

pupils. It may be that this prophylactic and corrective service will be more and more replaced by educational and examination service as the community is educated to the value of continuous dental care and improved nutrition in the community as a result of health education. In fact, this proportion of dental hygienists and dentists probably would not be sufficient for thorough service, but with adequate health education on the part of the teacher and the dental hygienist it should result in a new attitude toward the care of the teeth. Recent studies seem to show that adequate handling of this problem must include improved nutrition during the prenatal period as well as proper diets throughout childhood.

SCHOOL NURSING SERVICE

It would appear from the reports received for 1923 that there has been a definite extension of school nursing activities since the survey made in 1920, both in the official recognition of such a service and in the proportion of nurses to pupils. With the exception of Dallas and Savannah,¹⁶ all of the 100 large cities made some provision for school nursing in 1923, either under the jurisdiction of the health department or the board of education. In 1920, 5 of the 83 cities reported no official school nursing, while 74 cities in that group employed special school nurses.

According to the records for 1923, in 86 cities school nurses gave full time to school work. In 12 other cities the nurses assigned to school activities were apparently engaged also in other public-health work. In a few cities where a generalized nursing service has been developed to some extent the reports do not clearly indicate what other duties may be undertaken by school nurses.

Wichita, Hartford, and El Paso reported special school nurses and, in addition, nurses in school work who were also engaged in other public-health activities. In the first two cities the school health work was organized under the education authorities, and in El Paso this service was developed under a joint arrangement so that half of the nurses gave full time to school work under the school board and the other half, under the health department, gave only part of their time to school activities. In 7 of the 86 cities health-department nurses gave part of their time to other health activities, while in three other cities a similar service was provided by nurses employed under a joint arrangement between the health and education authorities.

¹⁶ In Savannah the local section of the National Council of Jewish Women conducted a nutritional demonstration in city and county schools in 1923, reporting a total expenditure of \$1,700. The Mary McLean Circle of King's Daughters provided some nursing service in city kindergartens. All recognized private agencies are organized in a health center which was reported to have been financed partly by funds received from the city administration. Twelve nurses from this health center devoted part of their time to school work.

TABLE VII.—*Number of nurses engaged in full-time school nursing activities in 82 cities, 1923*

Population groups	Number of cities reported	Total school enrollment	Total number of nurses	Number of pupils per nurse	Number of nurses per 10,000 pupils
Group I.....	9	2,450,942	653	3,753	2.66
Group II.....	14	786,705	321	2,451	4.08
Group III.....	41	1,102,881	389	2,835	3.53
Group IV.....	18	276,632	96	2,882	3.47
All cities.....	82	4,617,160	1,459	3,165	3.16

NOTE.—This table includes high-school enrollments whether served or not, and parochial schools where served. All nurses included were on a full-time basis. All supervising nurses are included as well as parochial-school nursing staffs wherever satisfactorily reported as a separate staff.

In Table VII there are included 82 cities for which fairly reliable data were recorded for 1923. This tabulation of full-time school nursing services in this group of cities gives an average of 3.16 nurses per 10,000 pupils, or 3,165 pupils per nurse. This average for 1923 is 0.57 per 10,000 more than were reported in 1920.¹⁷ In both surveys the cities in Group II (250,000 to 500,000) reported the largest proportion of nurses, and the increase in this group since 1920 has been greater than the average for the other groups. Relatively fewer nurses were employed in the cities having over 500,000 population for both years.

Figure 8 shows the frequency distribution of 80 cities arranged according to the proportion of nurses employed in school work. The mode, or greatest frequency in the relation of number of pupils per nurse, contains the 23 cities which reported between 2,000 and 3,000 pupils per nurse, and it should be noted that 57 cities, or slightly over 71 per cent of this group, did not have more than 4,000 pupils per nurse. For the remaining cities there was a wide variation in the proportion of nurses employed.

It seems evident that, in so far as the number of nurses is concerned, these cities have made fairly satisfactory progress toward the proposed standard¹⁸ of one school nurse per 2,000 pupils. In the second group the average number of pupils per nurse has already nearly approached this standard. The fact that 18 cities exceeded this average in 1923 suggests the high regard for the nurse in the schools that has developed in recent years.

From varied comments included in the reports for 1923, and also from the writer's previous contact with the work of a number of the cities, it would appear that there is a wide variety of procedures followed by school nurses. Although nearly all cities reported a follow up of physical defects in the home, apparently no home visits were made in one city, although six nurses spent their time on weekly

¹⁷ Public Health Bulletin No. 136, p. 135, Table II. ¹⁸ Ibid., p. 264.

“general examinations.” In some cities all the time of the school nurse was apparently given to home visits, while in others most of her time was spent in the school. Weekly and monthly rapid classroom inspections were made in some cities, while in others this work was left entirely to the physicians or not undertaken at all except at the time of epidemics. The conduct of nutrition classes, frequent talks to pupils, and efforts to promote cleanliness and health habits formed

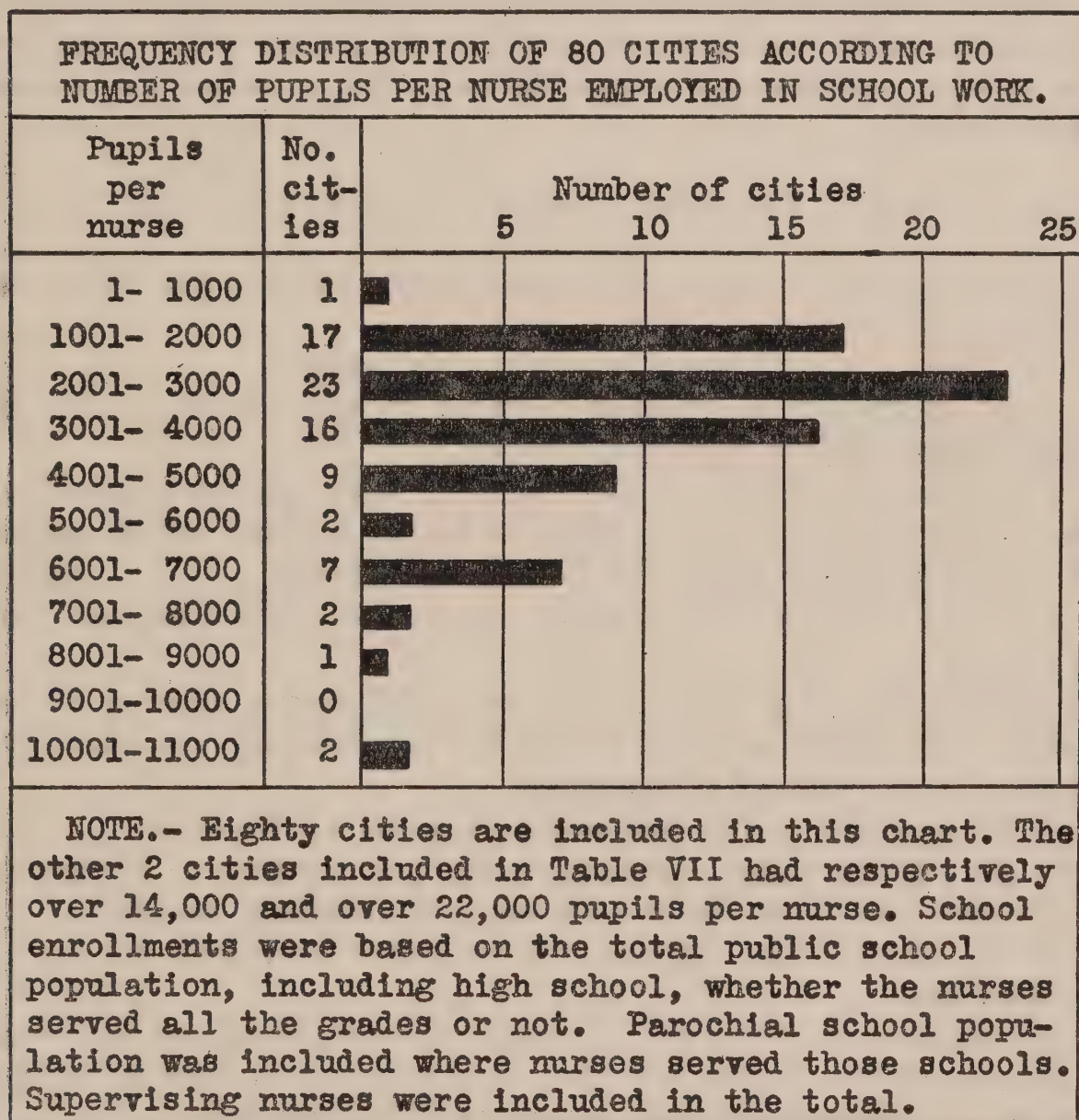


FIG. 8

part of the responsibility of many nurses, while in other cities all such health-education activities were handled by the teachers or physical-education specialists.

In some cities it would appear that the nurse was used more or less as an attendance officer following up all absentees of three days' standing. In other cities absentees were visited by the nurse only when known to be sick or where contagion was suspected or only at the time of an epidemic.

Notification of parents regarding physical defects by the use of a written or printed form or letter was the practice reported in 91 cities, while three cities reported that parents were notified by a personal call of the nurse. The nurses participated in various capacities in the physical examinations, testing vision and hearing, weighing and measuring, or merely recording the findings of the examination. In many cities they apparently took no part in the conduct of examinations, although it was not an uncommon practice for the nurse to examine part or all of the grades or to reexamine in order to check up on corrections after the physician had examined the child.

GENERAL DISCUSSION OF SCHOOL NURSING SERVICES

The activities of the school nurse should include the following principal objectives:

(a) The control of major and minor contagion:

1. By inspection of children referred by teachers who have detected some evidence of health disorder.
2. By demonstrating to the teachers, with the cooperation of the teacher supervisors, the signs of health disorder which arouse suspicions of the presence of communicable disease.
3. By encouraging the teachers to conduct daily classroom inspections.
4. By cooperating with the communicable-disease division of the health department in guarding against violations of measures prescribed for the control of contagion.
5. By assisting in the immunization of school children.
6. By treating minor contagion under the direction of the school physician when home neglect makes such treatment necessary.
7. By investigating absence due to illness in pupils having no medical care.

(b) Explanations and advice to parents in the home and the interpretation of the health activities of the school to parents having insufficient contact with the school:

1. By explaining the need for correction of physical defects.
2. By obtaining the cooperation of parents in carrying out measures for the health care of their children including the continuance of the measures recommended.
3. By giving suggestions and advice for better home care and interpreting the recommendations of the school physician.
4. By interpreting and adapting the advice of private or clinic physicians so that the family may make adjustments and apply the advice to meet individual home conditions.

5. By explaining and interpreting the health education activities of the school.

6. By advising parents regarding the work of the teacher involving problems in mental hygiene.

(c) Cooperation with other social forces of the community:

1. By referring families for relief and rehabilitation.

2. By seeking special service for children and families from such agencies as those concerned with Americanization, prevention of cruelty to children, bedside nursing, vocational training, summer vacations and health camps, home finding and institutional care, and recreational leadership.

3. By registering in the social-service exchange all difficult or problem cases with sufficient record to be useful to agencies that might assist the work of the nurse.

4. By reporting to the proper departments for their attention and action such problems as sanitation, housing, and prenatal and infant cases.

5. By making arrangements and adjustments with physicians, dentists, hospitals, and clinics for such care or examination of children as is recommended by the school examiner.

(d) Instructions to teachers in essential first-aid procedures:

1. By demonstrating to the teachers the administration of first aid in all cases needing such attention.

2. By advising and suggesting to the teachers the essentials of first-aid instruction, so that the teachers may be better prepared to give such instruction.

(e) Assistance and advice to teachers in carrying out health activities:

1. By assisting or advising regarding such activities as the weighing, measuring, and the preparation of weight tables, charts, and graphs.

2. By interpreting and explaining the significance of the findings of the school physician, and thereby promoting the interest of the teacher in the individual health problems of pupils.

3. By explaining to the teacher the relation between health habits and the health status of individual pupils and interpreting the influence of home environment conditions investigated by the nurse.

4. By advising in regard to subject matter for health education with particular reference to practical projects, such as the measures for the control of a contagious disease appearing among the pupils, the improvement of ventilation in the school, the care of the eyes, and such nursing demonstrations as may be required in connection with subjects like physiology and home economics.

(f) Assistance to school physicians or to any other special personnel provided for health supervision in schools:

1. By assisting in examinations.
2. By assisting and cooperating with teachers in the record keeping of the health service.
3. By supplying first-aid care if provisions for such a service have been made.
4. By undertaking such additional services as may be required by local needs and conditions or assigned by responsible authorities.

To carry on all these activities satisfactorily the school nurse should have a broad training not only in public-health nursing but in the fundamental sciences of hygiene and public health, social service, and educational psychology. She should have sufficient understanding of school problems to recognize and appreciate the needs and difficulties of the teacher and how she may best assist her. She must have the tact to lead the teacher from the dramatic situation of the handicapped child that can be helped through the teacher's enthusiastic cooperation to the appreciation of similar but less dramatic health service that the teacher can render to the many other physically defective children. To obtain the confidence of the parents and to persuade them to cooperate in carrying out the advice of the school health authorities requires unusual judgment and diplomacy as well as understanding of the psychology of the many kinds of parents. To bring to bear the influence of friends of the family and the other social agencies of the community to assist in interpreting and explaining the health needs of the children demands an understanding of social case work procedure as well as of the resources of the community.

This presentation of the duties of the school nurse places upon her considerably more responsibility for winning the interest and cooperation of the teachers in the health program and for cooperating with and seeking the assistance of other social forces of the community than is ordinarily exercised by school nurses. School nursing has grown very rapidly during the past 15 years. The demand for follow up of the handicapped physical defectives and the control of communicable disease has resulted in the employment of many nurses fresh from hospital training schools or private duty nursing or at best from organizations doing bedside nursing, with the result that school nursing procedure generally lacks well-defined standards either of methods or accomplishments. Nevertheless, a few able and ingenious nurses have, with true pioneer spirit, offered some splendid examples of organization, leadership, and service. but even under the best of conditions there has often been a lack of that

cooperation in the school and coordination of other community agencies needed to make possible the largest effectiveness of the work.

The need for obtaining the cooperation of the teacher is best illustrated by the all too common practice of nurses trying to control major and minor contagion by routine, rapid, classroom inspections. These inspections often result in the discovery of a number of cases of nits, pediculosis, and skin infections, and an occasional late desquamation from scarlet fever or a possible case of diphtheria or one of the eruptive fevers. Obviously the prevention of any of these conditions demands prompt recognition and exclusion, but the necessary inspections usually can not be conducted by the nurse more often than once per month or at best once each week, and unless the teacher fulfills this function by her daily inspection very little effective prevention can result. Therefore the value of these inspections must lie in the education of the teacher to recognize those cases needing attention, and the nurse must gain the support of the teacher in order to make this service effective.

The ability of the teacher to detect a tendency to fatigue or to poor posture, frequent minor illnesses, evidence of eye strain, or mouth breathing necessarily aids the school physician in the early recognition of health defects needing attention. The successful nurse can secure the cooperation of the teacher by demonstrating to her how her day-to-day observations can lead to helpful advice from the physician, improved health of the child, and better school work.

To win the cooperation of parents so that proper health care of children may be provided, it is necessary not only thoroughly to explain why specific attention should be given, but, in case of fears or prejudice, the assistance of friends, the priest, a social worker, or a visiting nurse who has the confidence of the family must be solicited. The nurse's contact with these other social agencies and the registration of problem cases in a confidential exchange should aid in obtaining this assistance.

Obviously all these activities of the school nurse presuppose special training. The present lack of training facilities has created a demand for more adequate supervision by thoroughly trained supervisors in order to develop proper procedures, make contacts with the teachers and teacher supervisors, and to stimulate higher standards in service. A standard of one nurse to every 2,000 pupils has frequently been recommended, but with a personnel of inadequate public-health training it is the opinion of the writer that a trained field supervisor for every five or six nurses is equally important.

It is probably not desirable to attempt to standardize all school nursing procedures or to urge a general adoption of uniform

technique or methods. Many of the routine activities now carried on do not, however, utilize the services of these nurses economically. A critical analysis of the various nursing activities in a selected group of cities, together with an attempt to determine the relative values of these activities and an economic division of services to be rendered, and to some extent at least a selection of proposed standards or uniform procedures and records, would undoubtedly prove of great value to administrative officials desiring to improve their nursing services. Very little accurate or detailed knowledge is available concerning the experiences in different cities in respect to school nursing activities. For this reason there is need of a careful analysis of present practice and a clearing house of the experiences and results accomplished in different cities.

SCHOOL LUNCHES

Provisions for school lunches evidently has been fairly generally accepted as a function of school management. According to the reports received for 1923, some sort of a lunch was served in schools in 86 cities, in 8 cities under the management of nonofficial agencies such as parent-teacher associations, while in 10 cities lunches were provided partly by school authorities and partly by nonofficial agencies. In Springfield it was reported that \$62,000 was expended by the city for these lunches. In Seattle an expenditure of \$155,000 for school lunches for indigents in grade schools was met by an actual cost charge, and in addition cost charges amounting to \$7,500 were received against an expenditure of \$11,500 for milk served in schools.

From rather meager information it seemed evident that the lunch service in probably a majority of the cities reporting was usually a mid-morning lunch of milk or milk and crackers for which a charge of from 3 to 7 cents was made. A number of cities provide free milk for indigent pupils at public expense, while in other cities nonofficial agencies supplied indigent children. Lunches were provided both by school authorities and by contract. It was not possible from the records received to determine whether lunches were served only to pupils in special classes or to selected grades, or whether noon lunches were provided for all pupils in elementary grades.

GENERAL DISCUSSION OF SCHOOL LUNCHES

The practice of providing school lunches was introduced following the recognition of the problem of malnutrition in those schools where many of the pupils were suffering from the effects of poverty or neglect. It was found that children who had been in the habit of going to school without breakfast showed a remarkable gain both in health and school work when they were given nourishing lunches.

The school-lunch idea was extended to provide hot lunches for pupils who would otherwise bring their lunch to school or go home to eat a cold lunch that had been left out for them. This mid-morning milk lunch has been offered as a form of supplementary feeding and to encourage children to drink milk. The remarkable results in overcoming malnutrition that has frequently accompanied both forms of school lunches when combined with education and suggestions for improving home diets has led many school authorities to organize school lunches without sufficient emphasis upon the educational opportunity offered by this new school departure.

School lunches under the direction of a trained dietitian should be available for all children in special classes or others who live at a distance from home or who, because of neglect or the employment of their mothers, are unable to obtain otherwise a satisfactory noon meal. The educational value of the school lunch, however, should be emphasized and provision made through home-economics courses to extend this educational influence continually to all children who are in the habit of eating their noon lunch at home. Such a recommendation means that the selection of menus and cooking should be under expert supervision with a teacher or nutrition worker in attendance at the meals in order to correlate health education with the food service. Competition and health projects should guide children into habits of eating those foods that are necessary in proper diets. In the opinion of the writer children unable to pay for lunches in school should be cared for as a private or city charity rather than as a school or health department service.

The mid-morning milk lunch should be organized more for its educational value than for the benefits of supplementary feeding. With proper educational devices the milk lunch in school will often influence children to drink more milk at home. The child who will not drink milk at home is led by group influence to learn to like milk. The interest of the child should lead to the education of the parents in the food value of milk and its greater consumption in the home.

SPECIAL CLASSES

Among 99 cities reporting, all except 5 made some provision for "special classes." This implies a fairly general recognition of the importance of special educational facilities for the handicapped child. Classes for backward or mentally defective pupils were most prevalent. If all the classes for nutrition, open air or pretuberculous and for tuberculous children are included, 80 out of 95 cities reported such special classes.

Thirty cities definitely mentioned classes for the deaf, while 64 gave no data on this inquiry. These classes include lip-reading courses by special teachers who go from building to building devot-

ing one or two hours per week to each group of pupils and in addition special full-time schooling for the totally deaf or those with very little hearing.

Twenty-five cities reported special classes for pupils with defective vision while 68 cities gave no data. Only 19 cities specified special classes for cripples, while eight cities mentioned special posture or provisions for corrective gymnastics.

Table VIII shows the number of cities in the different groups that reported provision for five types of special classes.

TABLE VIII.—*Special classes provided for handicapped children, 1923*

Population groups	Special classes for—				
	Mental defectives	Visual defects	Hearing defects	Posture and cripples	Tuberculosis, nutrition and open air
Group I (12 cities):					
Cities having classes.....	10	6	5	7	11
Cities with no classes.....	1				
No data given.....	1	6	7	5	1
Group II (16 cities):					
Cities having classes.....	16	6	7	7	16
Cities with no classes.....					
No data given.....		10	9	9	
Group III (50 cities):					
Cities having classes.....	44	12	15	11	37
Cities with no classes.....	3	3	3	3	12
No data given.....	3	35	32	36	1
Group IV (22 cities):					
Cities having classes.....	16	1	3	2	16
Cities with no classes.....	5	4	3	3	3
No data given.....	1	17	16	17	3
All cities (100):					
Cities having classes.....	86	25	30	27	80
Cities with no classes.....	9	7	6	6	15
No data given.....	5	68	64	67	5

In addition to the data included in Table VIII, two cities reported special classes for truants, and in two other cities there were classes for incorrigibles. Eleven cities reported classes for speech defect, five cities cardiac classes, and one city a class for anemic children, and in one other a special class for children with trachoma. Nine other cities reported classes for "physical defects" (not specified).

The data collected for 1923 and presented in Table VIII gives no indication of how completely the problem of special classes had been solved, since each city that reported one special class has been included in the table. The reports of the number of pupils cared for were incomplete, but a tabulation as given by ratio of pupils in special classes to the total school enrollment indicates a wide variation in the proportion of pupils provided for in all the various types of classes.

Special class provision for backward and mentally defective pupils has been more thoroughly developed in many cities than other special

class service. Nevertheless, the frequency distribution of 65 cities with respect to such provision, as illustrated in Figure 9, indicates that in 13 of these cities provision was made for only 1 pupil out of each 300 or more enrolled. In 7 cities provision was made for 1 or more pupils out of each 100 enrolled.

Although the large proportion of cities that have made some provision for special classes suggests an acceptance of the importance of such care, there is undoubtedly need for extending this service to

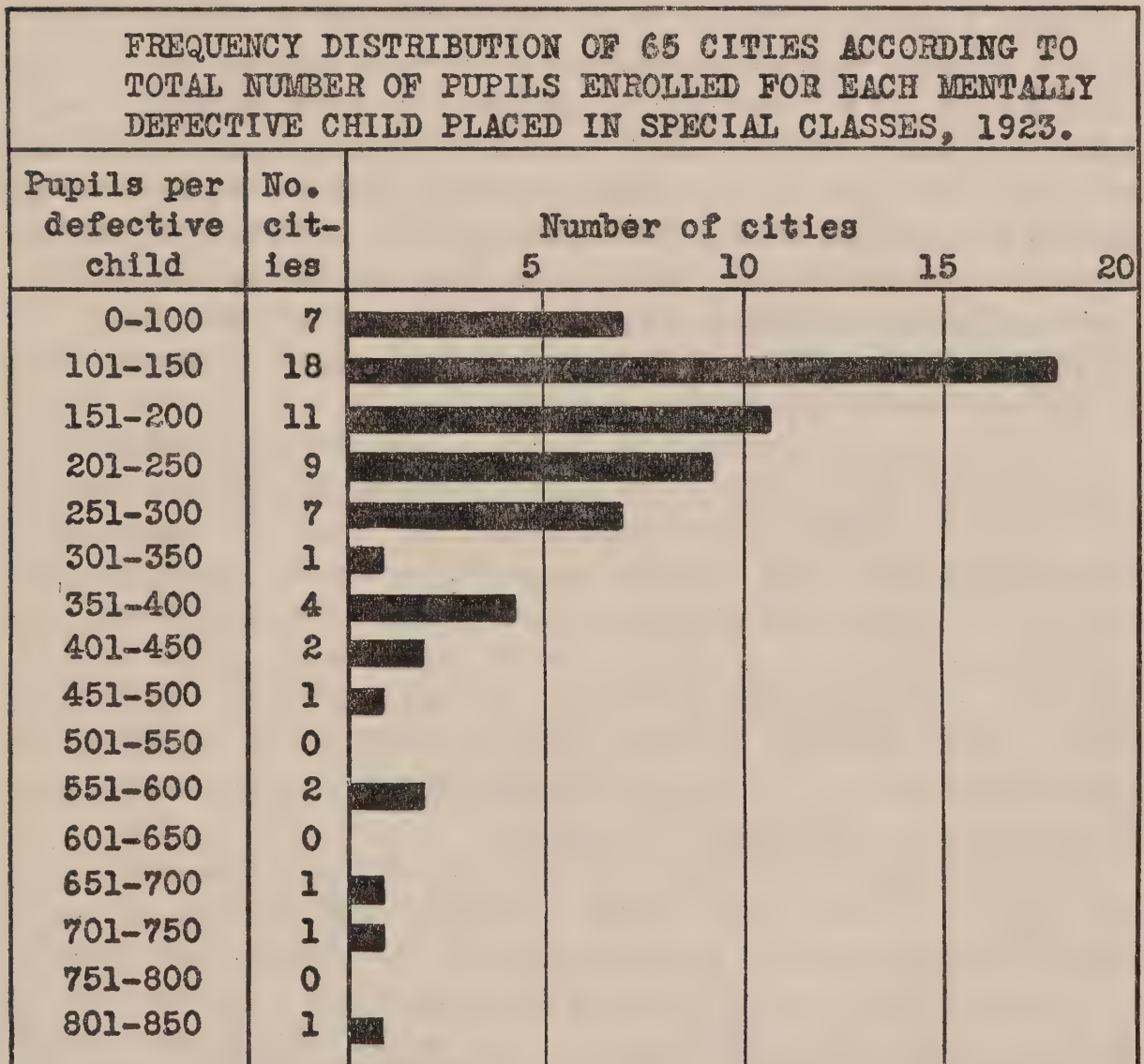


FIG. 9

provide for many more pupils. With the advent of mental tests the educators have frequently made special provision for the mentally retarded child in order to segregate the cases that tend to impede routine classroom work and at the same time provide special work for those cases that can not profit from the curriculum designed for the average child.

The large number of cities that have made special provision for tuberculous suspects and contacts, and for malnourished children indicates a definite attempt to face a serious health problem. Classes

for the deaf, crippled, and blind are frequently a further attempt to provide training or education for children who would otherwise be neglected, while the classes provided for children with defective vision and posture conditions, or classes for corrective gymnastics, generally may be classified as health service.

GENERAL DISCUSSION OF SPECIAL CLASSES

Recognition of the importance of educating handicapped children has been a strong influence in the establishment of special classes. Demonstrations with pretuberculous children in open-air class rooms have introduced new policies in special class work, namely, special follow up and intensive health education service as a health conservation measure. If these policies were carried out with all special groups that might benefit from such service, it would become an expensive procedure. It would also tend to relieve the regular classes of many children who are often a considerable factor in demonstrating to teachers the part that they might profitably take in a school health program.

With a proper recognition of health education in the school curriculum, with more attention to health problems in teacher training, and with health-education supervision, the work of the regular classroom teacher will include more of the special attention and service that is now given in the special classes. Special classes will still be necessary to meet the special educational needs of such children as the mentally defective, the deaf child, the low-vision child, and possibly the crippled child who can not be cared for in the regular classes. Correction of speech defect and lip reading may be taught as a supplementary subject.

These special classes should have the careful consideration of all executive staffs of school health services. On account of extra cost of special classes it is important that the children selected for this extraordinary attention should include those most in need of and most likely to profit by special class work. The special schooling in every case should be supplemented by any medical or surgical aids that give promise of alleviating or limiting the effect of the handicap. The provision of such medical and surgical service as is usually required by these children frequently demands extraordinary measures on the part of the school medical and nursing service.

Parents must be led to appreciate that the handicap may be alleviated or its further development prevented through proper medical or surgical attention. It may be necessary to give the parents a fairly definite prognosis and to overcome their strong conviction that the handicap must be accepted without interference.

Here the diagnosis and prognosis of the specialist employed in the school health service frequently becomes a deciding factor in securing the attention needed in special classes. The cooperation of the social service agencies in determining those persons likely to have the confidence of and able to influence the family is another special measure that should be sought in providing proper health service for this group.

HEALTH EDUCATION

Some form of health education was reported for every city. These activities undoubtedly varied in character from the most modern projects in a few classes in some cities to mere textbook recitations on anatomy and physiology, with no emphasis on training in personal hygiene and in some instances without reference to any public-health problem. The records obtained were frequently very meager as to the quality or character of the health teaching undertaken. All cities except Houston reported that health instruction was given in the elementary grades. In seven cities health instruction was provided for only part of the elementary grades, but all the instruction was obligatory where offered.

In 86 cities health instruction was reported as offered to high-school pupils. In 62 cities this instruction was obligatory and in 24 cities it was optional. This includes one city that required a course in domestic science, including health instruction for girls only, and two cities that gave optional courses to the junior high-school pupils only and none for those in senior high schools. Five cities specified that no health instruction was given high-school pupils and nine cities gave insufficient data.

There was apparently a wide variation in respect to the time requirements for health education in the high schools. Wichita required one hour daily, while in Seattle only one lecture during the first year was required. Omaha specified a one-year course, El Paso one term, Trenton six weeks, Bayonne and Salt Lake City 45 minutes daily, and Detroit and Los Angeles, respectively, 30 and 40 minutes daily, while the time requirements in six other cities were indefinite or irregular.

Special directors of health education were mentioned in the records of only seven cities, but this list is known to be incomplete. In 19 cities special teachers of health education were mentioned, including some cities where physical-education teachers give health instruction and where teachers of biology or other science subjects in the high schools included hygiene as part of their course. In Bridgeport, Fall River, Toledo, and South Bend nurses taught health in high schools, and in Detroit nurses were assigned to nutrition classes. In Albany all school nurses were required to have had a

special course in health education. In 40 other cities nurses were reported as assisting in health education. Special lectures and talks were mentioned in a few cities.

The "modern health crusade" was being carried on in 32 cities, and in 13 other cities some similar or equivalent form of health education was used. In 13 of the cities conducting a modern health crusade it was carried on by a nonofficial agency, usually the local tuberculosis society, and in two other cities it was conducted by the education authorities in cooperation with the nonofficial agencies. For seven cities such unfavorable opinions or experiences as the following were recorded: "Some opposition in the schools"; "takes undue amount of time"; "two unsuccessful attempts"; "tried and found wanting"; "tried out, failed, abandoned"; "costs too much"; "supervising nurse feels it teaches child to make false reports."

GENERAL DISCUSSION OF HEALTH EDUCATION

"The aim of health training and instruction should be to assure healthful living by—

- "1. The formation and practice of habits essential to health;
- "2. The acquisition of knowledge necessary to health; and
- "3. The development of right attitudes and ideals with regard to health, both physical and mental."¹⁹

Large responsibilities must be placed upon the teacher in order to make effective this aim. More attention must be given to teacher training in health education both in the teacher-training schools and while in service. The subject matter and technique also require health-education supervisors to work out with the supervising principals and other special supervisors plans for correlating health education with the teaching of language, arithmetic, geography, art, and other subjects of the curriculum. The successful experience of various teachers in developing graphic and dramatic devices in health education can be made available to other teachers and so stimulate improved procedures through the medium of the helpful supervisor.

School nursing and medical service under tactful supervision should secure the cooperation of the teacher in developing right attitudes and the acquisition of knowledge regarding cleanliness, the control of communicable diseases, and the correction of physical defects. If appropriate emphasis is placed upon the health service that would develop through health-education supervision, this should stimulate teachers to gain the interest of pupils and parents in carrying out such special advice as may be offered by the physician for the correction of malnutrition, the prevention of overfatigue and

¹⁹ See "Health for School Children," U. S. Bureau of Education, 1923.

nervous disturbances, and the observation and management of children suffering from special defects, such as heart disease, and uncorrectable defects of vision and hearing. Group conferences of representatives from the medical, nursing, physical-education, health-education, and teaching staffs should promote the development of cooperative relationships converging toward better health education.

Although it is generally recognized that both health workers and educators have in recent years made important experiments in methods of health education, we have no definite knowledge as to how generally these newer methods have been adopted in the current practice of the school systems throughout the country. Among all the more progressive educators there has come a recognition of the very limited value of the actual instruction derived from textbooks in common use 20 years ago when more attention was given to knowledge of human anatomy and physiology than to the practice of those habits necessary to sound development and bodily well-being.

SOCIAL HYGIENE AND SEX EDUCATION

Thirty-six cities reported some provision for teaching either social hygiene or sex education in 1923. It was contemplated in two other cities and a course for teachers was being arranged in Dayton. In five of these cities activities were "very limited" in scope. In 17 cities it was given by regular teachers as a part of such regular courses as biology, physiology, personal hygiene, and home nursing. Nine cities arranged special lectures, some by State agencies and some by physicians and nurses. Other cities reported that the subject was approached largely through individual conferences by regular teachers or special social advisors. Seventeen of the cities providing for such teaching reported that they employed social advisors in the schools and six other cities, although reporting no provision for such teaching, mentioned social advisors as a part of the school staff. Most of this instruction is apparently given in the junior or senior high schools and in a few cities in the continuation schools. In Oklahoma City five social advisors are reported for 7,000 junior and senior high-school boys and girls, giving weekly talks, advice, and "personal inspections" of the pupils.

In general, it is probably safe to say that attempts to teach sex education have not been as a rule well defined, but have depended largely upon the interest of individual teachers who present the subject as occasion arises or in the course of other instruction.

General discussion.—Since the World War a marked change has taken place in the attitude of the public toward the problem of

social hygiene and sex education. The fact that attempts have been made to promote some teaching along this line is significant and offers hope that a changed attitude will lead to more teaching in the future with definite social hygiene values.

The teaching of the biological sciences and careful interpretations of natural laws governing life itself seem to promise plenty of material for introducing the child to such facts of sex and social hygiene as should lead to better physical and mental health and fewer tragedies due to ignorance. So few teachers, however, are equipped and trained to meet the problems that arise that more attention should be given to teacher preparation in connection with this important subject. Teacher training in the psychological and physiological development of the child and in the method of correlating the facts of sex knowledge with nature study, biology, hygiene, and public health offers the most direct approach to the problem that has been offered thus far. No doubt school officials should first consider "that the lives of children are so filled with normal interests that the abnormal and undesirable are crowded out. If a well-rounded and supervised program of exercise and recreation is provided, if physical defects are corrected, and health habits are formed, if the strain of school life is not too severe, and if the school plant is so built and supervised that the children may fully express themselves in work and play, many of the difficulties ordinarily encountered will never arise."²⁰

PHYSICAL EDUCATION

For 1923 every city except Lawrence reported some physical education activities in the public schools, and since the survey was made this city has employed a director and 10 assistants. In 43 cities there was a special director of physical education who, in a few instances, was also in charge of health education.

Since the survey was concerned largely with health-department activities, the reports were inadequate to determine the character or the extent of the physical-education activities. It is known, however, that the type of program varies in different cities from simple, formal exercises in the classroom under the direction of the physical director or the classroom teacher to well-organized play, athletic games and sports, formal and natural gymnastics, and corrective exercises. The use of gymnasiums and swimming pools is more frequently reserved for high-school students, except in those cities where the school system is organized on the platoon or work-study-play plan.

²⁰ See "Health for School Children," U. S. Bureau of Education, 1923.

General discussion.—The influence of the German and Swedish leaders in school gymnastics has made its impress upon physical education in the schools of this country. The rigid adherence to formal exercises and drills with movements limited to specific groups of muscles has been interspersed with the more natural exercises of games, running, jumping, throwing, swimming, and combat. The commercial exploitation of school athletics with great exhibitions by small groups of highly trained youths and thousands of passive onlookers has unfortunately outgrown the direction of our educational leaders. The imitation of the huge college spectacles, with their high specialization for the few, and foolish worship of athletic prestige and records has so overshadowed the efforts of the educators to provide rational physical education through play, games, and competitive sports that the public has attained very wrong ideas of the aims and objectives of physical education in a school program. This confusion regarding aims has been further complicated by the quite different objectives set forth by the advocates of the formal-exercise approach to physical education.

With a clarification of the aims of general education and the recognition of the educational importance of interest and effort in realizing those aims, there has come about a new appreciation of the value of physical education and a new statement of objectives that includes the development of moral and mental qualities as well as physical development.²¹ With the recognition of these aims the field of physical education offers the prospect of a broader opportunity for correlating this subject with health education.

The part that physical education should play in a school health program includes more than the mere opportunity for bodily exercise. Whatever may be the aims sought it is evident that in these 100 largest cities the school authorities have felt the need for some physical activities in the school curriculum. The important task still confronting these authorities is to organize and develop this phase of the school program, so that the largest values are obtained. The organic need of every normal child for motor activity of the larger groups of muscles is unquestioned and the restraint occasioned by the ordinary classroom program is a direct violation of this need. To prepare a school program that gives expression to the demand for physical activity, that provides the motor experience necessary to education and at the same time contributes to mental hygiene through the development of such qualities as sportsmanship, self-reliance, self-control, courtesy, and physical and moral courage

²¹ For discussion of these aims of physical education, see the writings of Dr. Jesse F. Williams and William H. Burnham, "The newer aims of physical education and its psychophysical significance," *American Physical Education Review*, January, 1922.

demands careful planning and management of physical education activities.

The gradual and early training in motor coordination through such basic experiences as climbing, throwing, striking, running, and jumping that occur in simple games should lead to skill that can be developed further in the games and sports popular in modern civilization. This training in skill and satisfaction in physical activity should be developed so that permanent interests are established that will lead to participation in recreational exercises in adult life. Satisfying experiences and skill in such physical activities during childhood are generally essential to a desire for the games and invigorating exercise so essential to continued physical fitness for most sedentary adults. Individuals show apparently a natural liking for particular forms of recreational exercise so that in order to develop interests that will carry over into later life, considerable variety of experience must be offered in either the regular school physical training or in the extracurricular activities.

The organization of physical education classes so that training and experiences are closely correlated with the extracurricular activities provides an opportunity for so adapting the program that the objective sought may be offered to nearly every child. Credit rating, competition of large groups, indoor athletics, scouting, stunts, pageantry, and dancing are some of the forms of training that reach large groups of children so that the weaker as well as the stronger children are given an opportunity to participate. The development of these methods of promoting participation of all the pupils need not altogether replace team athletics, but they certainly should be placed first in the physical education program before the highly specialized team absorbs the entire thought of pupils and faculty as being the sole end of school physical training.

The play activities of the younger grades and the training for excellence in the sports by the older pupils should be closely correlated with health education and the advice of the physician and nurse. The interest in physical activity provides an excellent medium for introducing the ideas of health habits, and the desire to attain physical fitness in order to excel in athletics and attain muscular strength and endurance provides a powerful motive for the development of knowledge and appreciation of personal hygiene. In fact, the leadership of the physical-education teacher may even persuade the pupil to carry out the advice of the physician in regard to physical defects when the health motive has utterly failed.

The platoon or work-study-play system generally provides for physical-education teaching carried on entirely by special teachers while the usual classroom organization provides for handling the activities by the classroom teacher supplemented by trained super-

vision. Supervisors are necessary for both systems in order to promote proper standards of teaching and to develop correlations with such other health activities as health education and the medical and nursing service. Where the classroom teacher conducts the physical-education program, a sufficient number of physical-education teachers should be provided to permit the specialist to do demonstration teaching and observe and hold helpful conferences with the teachers with sufficient frequency to promote continuously better teaching methods.

SCHOOLHOUSE CONSTRUCTION AND EQUIPMENT

The present survey collected rather meager data concerning the problems involved in the sanitation of school buildings and equipment. The constructional details of the school plant, the site selected, the lighting, heating, and ventilating facilities, the arrangement of rooms, and the equipment such as blackboards, seats, toilets, lavatories, drinking water, fire protection, and erasers, crayons, books, and other expendable supplies, all have an important bearing, directly or indirectly, on the health and welfare of the pupils. The formation of health habits and the development of proper attitudes toward personal hygiene depend in a large measure upon the sanitary and mechanical features of the school plant. Many ill-constructed buildings represent such a large investment that they are not likely to be replaced by modern construction for many years, but proper presentation to the public of the needs from the health standpoint with suggestions for remodeling and equipment should do much to improve these conditions ultimately.

Local politics and lack of appreciation and understanding of proper standards of school-building construction and equipment all too frequently limit the support of the public. More public education by national agencies with explanations of the definitely accepted standards of the sanitary features of the school plant would bring about a better understanding of this phase of school health service by clarifying the issues.

The experience of those States in which supervision of schoolhouse construction is a function of the State health department and the results obtained by those cities using the school sanitation score-card plan for purposes of inspection and report should be made available for other cities who wish to improve their school buildings and equipment.

SUMMARY AND CONCLUSIONS

1. Modern education has generally recognized the need of promoting healthful living by means of health education and the services rendered by school physicians, nurses, physical-education teachers, and other specialists concerned with health problems.

Ninety-eight per cent of the cities surveyed had some form of organized school health service in 1923.

2. School medical and nursing services are usually directed by the health department in the larger cities and by the education department in the smaller cities. According to the reports for 1923, health service in public schools was under the supervision of the health department in 23 cities, under the board of education in 58 cities, and under joint supervision of both departments in 17 cities.

Parochial and private schools apparently received no health service from either department in 35 cities. In 7 cities nonofficial agencies gave some attention to these schools and in 56 cities some service was provided by either the health department or school board. Further consideration should undoubtedly be given to the need for adequate supervision of the health needs of pupils enrolled in parochial and private schools.

The question as to whether supervision of school health work should become a proper function of the health department or be exercised by the educational authorities remains open to further discussion. Arguments have been presented for both sides. The solution of this problem must consider the requirements of the educational authorities as well as the purely health aspects. The interests of both health and educational authorities are concerned, and in attempting to further develop school health activities there should be full cooperation between these two municipal departments.

3. Expenditures for school health service in 1923, based upon the records of cities in which fairly reliable data were obtained, indicated an increase over the expenditures reported in the 1920 survey. Cost-accounting records for school health work were generally unsatisfactory.

From the records obtained for 66 cities it would appear that average cost per pupil expenditures for school health service was considerably greater under school-board supervision than it was under health-department direction, and the smaller cities spent relatively more than the larger cities.

A critical analysis of items of expenditures for school health service is needed in order to interpret relative values of the various activities undertaken in the interests of the health of the school child.

4. Only about one-half of the cities studied for 1923 had full-time officials in charge of school health activities, and many of these full-time directors were responsible for other health activities. The majority of these cities employed one or more staff physicians for school service, but in 15 cities there was only one physician, either whole or part time, and in six cities no physicians were employed. Only 16 cities had full-time staff physicians. There was a tendency to

employ part-time staff physicians under a whole or part time director.

It seems advisable, in all cities as large as those under consideration, to provide a whole-time medical director, and if school activities are combined with other health services a medical assistant should assist the director in supervising the work of part-time staffs, at least in the larger cities.

The size of the medical staff needed to render adequate service depends upon the service that is undertaken. One part-time staff physician, giving 12 to 15 hours' service each week, should be able to render fairly satisfactory service to each 4,000 or 5,000 pupils.

5. The survey for 1923 was inadequately informative concerning the employment of medical and surgical specialists for school work. Specialists were reported in at least one-fourth of the cities studied, including psychologists, psychiatrists, ophthalmologists, orthopedists, and others for eye, ear, nose, and throat conditions. Consultant service should be available in all important specialties.

6. Physical examinations of school children are undertaken in nearly all of the cities in the present survey and over one-half of these cities attempted to provide examinations as frequently as once each year. More comprehensive and detailed facts concerning the character and scope of these examinations is needed to serve as a stimulus for improved examination technique and methods of record keeping.

Information relative to the character of the examinations undertaken in many cities indicate that there is need of considerable improvement in the general plan and methods adopted. Frequent examinations, although lacking in completeness and thoroughness, have undoubtedly discovered many correctable handicaps. Rapid examinations, at least four times during the child's school career for the purpose of detecting major handicaps, seem advisable, emphasis being placed upon the more serious defects. A thorough pediatric examination once or twice during the school career is probably also desirable.

Little effort seems to have been made in many cities to secure the attendance of parents at the time of the examinations. As a consequence the opportunity for the examining physician to give helpful advice directly to the parent concerned is frequently lost. The educational aspects of this important feature of school health work has evidently been neglected or overlooked.

The frequency of reported defects varies fairly widely in different cities. This variation may depend, in part at least, upon the different methods employed in the examinations and the recording of findings.

7. Dental service provided for the cities examined for 1923 apparently shows an increase over that reported for 1920. For the group of cities included in both surveys there were nine more cities reporting some dental service in 1923 than reported this service in 1920. Facilities for dental service was provided in 83 of the 100 cities studied in the present survey. Many cities have employed dental hygienists and other assistants, the ratio of dental personnel to pupils varying rather widely.

There was evidently a considerable variation in the percentage of dental defects reported in different cities as well as in the percentage of corrections. In some cities apparently only the more serious defects were recorded.

Some cities furnish all dental service free, while others require a nominal fee from those able to pay. The solution of this problem is not an easy one.

8. School nursing service has been extended since the survey of 1920. In 1923 all but two of the 100 large cities provided some nursing service in the schools and one of these cities has since reported that 12 school nurses had been employed. In the 82 cities for which the information was obtained there was an average of one nurse per 3,165 pupils, a slightly higher ratio than obtained in 1920.

The character of the service undertaken by school nurses varies considerably in different cities. School nursing procedure, generally, lacks uniformity, and well-defined standards of methods or accomplishments. There is need of further study of many of the problems concerned in order to determine an economic and effective division of the nurse's time and to establish definite principles.

9. School lunches of some sort were provided in schools in 86 of the 100 cities included in the survey of 1923. Some provision should be made for luncheon service for children in special classes and poorly nourished children who are not in a position to receive adequate and proper nourishment. A more critical analysis of the experiences of different cities in providing school lunches would measure the need for such a service and its essential requirements.

10. Special classes for handicapped children were reported in all but five of the 99 cities giving this information for 1923. The information at hand does not indicate how effectively the problem of special classes has been solved. Many cities have recognized the need for special facilities for mentally defective children. Eighty cities made some provision for either special nutrition classes or classes for tuberculous children. Special classes were also provided for children with other important handicapping conditions.

Adequate medical and nursing supervision over children enrolled in special classes is essential in order that proper selections of cases

may be made and the service made available to those most in need of it, at the same time making it possible to insure such corrective measures as may tend to limit the effect of the handicap or prevent its further extension. The services of consulting specialists are frequently required.

Facilities for the care of physically and mentally retarded pupils are frequently inadequate and more information is needed to develop a satisfactory program for the training and rehabilitation of these unfortunates.

11. Health education, in some form or other, was reported for every city in the present group, although the records throw but little light upon the value of the instruction given. Correlation of health-education methods with the usual routine courses in the school curriculum is necessary. In recent years there has accumulated considerable valuable experience in practical health-education methods, emphasizing the need for the development of health habits and proper attitudes, but information is lacking as to the extent to which this experience has been utilized in the schools of this country. Better methods will undoubtedly follow as a result of further study of this problem.

12. Social hygiene and sex education in schools was given some attention in 36 cities in 1923, but in general this subject has not been accepted seriously as a part of the school program. Relatively few teachers are equipped to meet this problem, and teacher-training schools should seriously consider the relation of this subject to other branches of teaching.

13. Physical education has been accepted rather universally as a proper function of the school program, at least in all of the 100 cities in the present group. Although the extent of the facilities offered varies, many cities have fairly extensive organizations supervising and directing various activities providing physical exercise and training as a part of the school curriculum.

Physical education includes more than the mere opportunity for bodily exercise. Comparative athletics and exhibitions of skill by small groups should not become the chief objective of physical education, but physical education should be correlated with health education, so that qualities of sportsmanship, self-control, and moral courage may be developed.

14. The survey for 1923 offered very little helpful information concerning sanitary features of schoolhouse construction and equipment. The experiences of those cities that have given trial to various procedures and devices intended to promote the sanitation of school buildings should be carefully reviewed and made available. Acceptable standards or minimum requirements in school sanitation should engage the attention of all health and educational authorities.

B. Proposed Plan of Organization for School Health Supervision

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The exact plan of organization required for adequate supervision of the health of school children depends somewhat upon whether these activities are carried on as a function of the department of education or the health department, as indicated in the foregoing discussions. Under the administration of either department, reasonably adequate provisions should be made for such supervision as is necessary to insure the highest attainable efficiency, both physical and mental, for all school children. The logical extension of this service to parochial and private schools is perhaps an argument in favor of placing this responsibility in the hands of the health authorities.

Without further reference to the municipal authority responsible for exercising supervision over school-health activities, the following budget²² is proposed as the basis of a practical working organization for a medical and nursing service for an average city of 100,000 population with 16,000 school children and an appropriation allotment of approximately \$2.25 per pupil:

Physician in charge (part of his time)-----	\$2, 500
Four school physicians (part time)-----	6, 000
Consultant medical services (part time)-----	1, 500
One psychiatrist, consultant in mental hygiene (part time)-----	1, 000
One supervising school nurse-----	2, 500
Eight staff nurses-----	13, 200
One dentist (half school time)-----	1, 500
Three dental hygienists-----	4, 500
One clerk-----	1, 300
Maintenance-----	2, 000
Total allotment-----	36, 000

Under health department supervision the physician in charge of school health activities could advantageously carry on all of the duties required of the chief of a bureau or division of child hygiene. Under such an arrangement the budget suggested above would be credited with about half his salary.

A school health service, organized entirely within the department of education, would require a whole-time medical director

²² The budget offered here approximates the total budget proposed in Public Health Bulletin No. 136. The total budget included in the "ideal" plan prepared on the basis of the surveys made in 1920 represented an allotment of approximately \$35,700, including the salaries of one supervising and eight staff nurses, or a total expenditure of about \$2.23 per pupil. The present budget indicates a reduction in the number of part-time school physicians but provides for additional consultant services. It also reduces the outlay for dental services. It is not presented as a substitute for the "ideal" budget previously offered but merely serves to indicate the author's interpretation of present needs based upon evidence presented in the preceding discussion.

(salary \$4,000 to \$5,000), who should also assume charge of health and physical education activities, be responsible for the sanitary features of the school plants, and act as consultant on the problems of hours, curriculum, and other circumstances affecting the health of teachers and pupils.

The school physicians and consultant services indicated would provide for the necessary medical examinations. With the further development of mental hygiene, additional consultant and other special services will be required, and a trained "visiting teacher" may be needed for more extensive follow up of problem children in school.

Medical, surgical, and dental service for the treatment of physical defects should be provided in every city for children unable to receive private professional services. These items of cost are not included in the present budget.

The salaries of one supervisor and eight staff nurses are included in the proposed budget. In those cities in which a generalized district plan of public health nursing is in operation the equivalent of the services of these nine nurses should be charged or applied to school work, the time of these nurses divided between school examinations, clinics, follow-up visits, and other duties assigned by the physician in charge. In cities with large industrial and foreign populations or where school health service is being developed, the ratio of 1 nurse to 2,000 pupils may be somewhat inadequate, especially under the specialized nursing plan.

The activities of a school nursing service, belonging to the department of education, are somewhat more limited than such a similar service would be when forming a part of the health department organization, particularly in the follow-up work in the homes, although it is feasible and possible to secure complete coordination between the nursing activities of both departments.

The proposed dental staff permits only of a demonstration and examination service. Demonstrations of prophylaxis and dental treatment might profitably follow one group of children through successive years with proper records and publicity as to the results of such care. The dental hygienists should examine the mouths of children and demonstrate to the teacher the conditions found in order to insure a proper understanding and basis for instruction and training in dental hygiene. Without a larger staff the dental hygiene program would rely upon educational methods in respect to nutrition and care of the teeth. This educational problem is a function of the educational staff with the assistance of the health education supervisor and dental personnel.

Both health and physical education are considered proper functions of the department of education and no provisions for these items are made in the budget proposed. The health education supervisor, an employee of the department of education, is expected to carry on his work in conjunction with other school supervisors. The physical education activities should carry a considerable part of the health education load and the personnel needed for this work would depend upon the school organization. It should be closely related to the medical and nursing service however the latter may be organized.

This proposed budget and general scheme of organization is not offered as a standard or "ideal." It is believed, however, that it does represent a goal that has been attained in one aspect or another in different cities and, as a guide, it should lead to good practice. It is not a panacea for all community needs in school health work. Wise leadership, a close relationship between the health and educational authorities, and the training of a capable and efficient staff are all essentials to a successful program.

C. Health of Children in Industry ²³

LEGAL PROVISIONS

Historical.—Within the last few decades practically all States have enacted legislation requiring the issuance of employment certificates to children entering industry. Federal child labor laws, one enacted in 1916 and a second in 1919, were in operation for brief periods, but each in turn was held unconstitutional by the United States Supreme Court. A constitutional amendment empowering Congress to regulate the labor of persons under 18 years of age was approved by Congress in 1924, and has been submitted to the State legislatures for ratification. (Not ratified.—*Ed.*)

The State laws, which now alone regulate child labor, differ materially in their provisions. In general, the laws set up an age, an educational, and a physical standard, which the child must attain before he can be employed in a specified list of occupations; they regulate the hours of labor and prohibit work in certain hazardous occupations. The enforcement is through an employment certificate system usually administered by the public school authorities, and through inspection of the place of employment.

Minimum standards.—The Children's Bureau, United States Department of Labor, has endeavored to raise the requirements of the State child labor laws to a higher standard than at present

²³ Original analysis prepared by Harold H. Mitchell, M. D., director of school hygiene, board of health, Fall River, Mass., and later revised and amplified in accordance with the records and data collected in the Office of Administrative Health Practice, U. S. Public Health Service.

obtains in most States, but has succeeded in only a few instances because it has only advisory powers in State problems. In 1919 a conference on child welfare met in Washington under the auspices of the Children's Bureau and adopted, among other standards, a set of minimum standards for children entering industry.²⁴ These are more stringent than the provisions of the Federal laws which were declared unconstitutional. No State equals these standards, but State legislation has advanced considerably.

A study of the schedules of the 100 cities included in the present survey indicates a deviation in the actual practice of some cities from the procedure and requirements specified in their State laws. Not infrequently cities in the same State reported different methods of complying with State requirements. Needless to say, legal requirements are apparently not always observed.

Adequacy.—Concerning the adequacy of the provisions of State child labor laws, the reports as given in the city survey schedules mean very little. In some instances the laws were reported as adequate, yet age requirements were ridiculously low, or the educational requirements were inadequate if not altogether absent, or no provision was made for determining the physical fitness of the child for the work he wished to enter. Since such statements regarding adequacy usually depend not on a widely accepted standard but merely on an individual as well as a local point of view, they are of little value for purposes of comparison.

To summarize, as a matter of record, 62 cities reported having adequate legal provisions, 11 inadequate,²⁵ and 27 cities ventured no statement on this subject. The cities reporting inadequate requirements included all the surveyed cities located in Colorado, the District of Columbia, and Georgia, as well as 1 city (of the 4 surveyed) in Indiana, 1 (of the 10) in Massachusetts, 1 (of the 3) in Missouri, 2 (of the 3) in Tennessee, and 2 (of the 5) in Texas. These figures illustrate the difference of opinion to be found in cities of the same State.

Oakland reported adequate State laws, but added that the supervision of working children was meager and, except for standards of work prescribed by the State industrial welfare commission, little constructive and remedial work was carried on. Minneapolis considered its child labor laws adequate for children up to 16 years of age, but stated there should be added a provision for part-time compulsory school attendance in the case of children over 16. In New Orleans age requirements alone were considered unsatisfactory and

²⁴ "Minimum Standards for Child Welfare," Children's Bureau Publication No. 62, Washington, 1919.

²⁵ Denver, Washington, Atlanta, Savannah, Indianapolis, Springfield, Kansas City, Mo., Memphis, Knoxville, Fort Worth, Houston.

an effort was to be made to change the law so as to provide for physical examinations and educational requirements. Portland reported its legal provisions as adequate when supplemented by rulings of the State industrial welfare commission. Tulsa believed its law should be clarified and harmonized with the compulsory education law. In Bayonne the law was considered adequate except for the absence of supervision as to the character of employment.

How well these statements on the adequacy of legal provisions in force compare with actual requirements can be partly determined by reference to the following discussions of the methods and procedures reported by the cities surveyed.

Enforcement.—The administration of State child labor laws is usually under the State department of labor or industry, or some equivalent bureau or commission. The actual issuance of employment certificates, however, is generally delegated, either by law or by the State agency having jurisdiction, to the local superintendent of schools. Where physical examinations are required, these are commonly made by the school medical examiner, working either under the school board or the health department. The prevention of illegal employment is in most instances attempted through the efforts of the State factory inspectors on the one hand, and the local school attendance officers on the other. The factory inspectors check up on the employment of minors in industrial plants and examine employment certificates on file with employers. The truant or attendance officers enforce the provisions of the compulsory education laws by visiting absentees from school, as well as by means of school censuses.

While this is, in outline, the administrative procedure generally pursued, there are differences and exceptions which will be described in the discussion to follow.

Enforcement was reported as good or excellent in 36 cities and fair in 7.²⁶ Thirty-one cities reported the law enforced, but did not state to what extent. In seven it was reported as poorly or inadequately enforced,²⁷ while in the remaining 19 cities no statement regarding enforcement was obtained. Trenton, which reported enforcement as inadequate, was the only city of the seven surveyed in New Jersey that did not report good enforcement. Birmingham stated that its poor enforcement was accounted for by lack of room in the schools, which allowed more children to work. Portland and Tulsa explained the inadequacy of enforcement as due to insufficient personnel.

²⁶ Denver, Kansas City, Kans., Wichita, Springfield, Kansas City, Mo., St. Joseph, Dayton.

²⁷ Birmingham, Washington, Atlanta, Savannah, Portland, Trenton, Tulsa.

EMPLOYMENT CERTIFICATES

Agencies issuing work permits.—Although, as previously stated, the general enforcement of the State child labor laws was in the hands of State officials, the local administration was largely under the jurisdiction of the school authorities.

The local granting of work permits or employment certificates, was, in 75 cities, performed by the city superintendent of schools, through his certificating officer, attendance officer, director of compulsory education, or some other subordinate. In 13 other cities certificates were reported as issued by some other local agency than the city board of education, as follows: By the health department in Detroit and Norfolk (even though in the latter the State law designates the superintendent of schools); by the county superintendent of schools in Omaha, as well as in Memphis and Nashville (in accordance with the Tennessee law), although in Knoxville they were issued by the associated charities; by the county judge in the five Texas cities that were surveyed; by the judge of the superior court in Tacoma; and in New Orleans by the factory inspector of the city department of public safety. In Flint the school authorities granted permits during the school year, but during the summer vacation papers were issued by the health department and the bureau of social service. In 11 cities certificates were reported as issued through either the main office or the district office of some State agency, as follows: By the State labor department or equivalent in Baltimore, Milwaukee, Portland, Spokane, Richmond, and San Diego; by the State board of education in Indianapolis and the four cities of Connecticut that were surveyed. The survey schedule for Savannah gives no data on the subject and indicates there was no organization that granted work permits.

Quite frequently the local issuing officer is required to file with the State department having jurisdiction a copy of each certificate issued or, at least, a report of the number issued.

Expenditures.—The personnel engaged and the expenditures incurred in connection with the operation of the work permit system are so inextricably entangled with expenditures for allied functions performed by the same agencies that it is impossible to segregate them. This is equally true of the State labor departments, whose duties are generally not confined to child labor alone; of the division of school attendance, vocational guidance, or continuation school of the local boards of education, such divisions usually devoting only part of their time to issuing certificates; and of the medical staff, which is usually charged with the physical examination of all school children as well as those applying for working papers.

In Boston apparently one school physician and one school nurse were assigned to the examination of applicants for working papers and possibly of working children attending continuation school, the salaries totaling \$3,066. In addition, one assistant superintendent of schools and six clerks issued certificates and performed other related duties.

In Buffalo a certificating officer and two clerks seem to have confined their activities to issuing permits, the expenditure amounting to \$5,000.

In Manchester the certificating officer presumably devoted full time to this duty, his salary being \$1,500, with \$600 for other expenses.

Wilkes-Barre estimated that the part time spent by its attendance officer and two truant officers on the work connected with issuing employment certificates amounted to \$2,000 per annum.

Age requirements.—In most States children under 14 were not permitted, in 1923, to leave school and enter industry. As a rule children between 14 and 16 years of age could not go to work until they had secured a certificate. In 5 States²⁸ the minimum age requirement was 15 years, in 3 States²⁹ 16 years, while in 5 States and the District of Columbia permits could be granted on account of poverty to younger children. San Diego reported that certificates were issued to minors only if less than the minimum wage established by the State industrial welfare commission was earned, as in the case of learners.

Some States allowed children below the specified age to engage in street trades or in work outside of school hours. According to the Children's Bureau Report for 1923, only 14 States and the District of Columbia required permits or badges for children selling papers or doing other work on the street, and only 10 had state-wide laws affecting boys engaged in independent street work.

Educational requirements.—Educational standards have been established by law in a majority of the States for children applying for work permits as well as for minors who are employed. For example, in 1923 no employment certificate could legally be issued to a child who had not passed the eighth grade in 9 States,³⁰ the seventh grade in California and Ohio, the sixth grade in 8 States,³¹ and the fifth grade in 4 States.³² Many States, however, had no grade requirement as a prerequisite to employment.

²⁸ California, Maine, Michigan, Rhode Island, Texas.

²⁹ Kansas, Montana, Ohio.

³⁰ Colorado, Delaware, Indiana, Minnesota, Nebraska, New Hampshire, Oregon, Utah, Washington.

³¹ Connecticut, Illinois, Iowa, Massachusetts, Michigan, New York, Pennsylvania, Rhode Island.

³² Alabama, Kentucky, Maryland, New Jersey.

Quite a number of States provided for compulsory attendance at continuation schools or night schools, for a specified number of hours per week, in cities where such schools are available, in the case of employed minors who have not attained a prescribed grade, until they have passed beyond the certificate age limit. The cost of maintaining continuation schools was reported as \$85,000 per annum in Fall River.

Occupational restrictions.—Many States exempted minors engaged in farm or domestic service from the necessity of obtaining employment certificates. On the other hand, the employment of minors was prohibited in certain hazardous or unhealthful occupations in a number of States.³³

Other legal requirements.—Most States reported that minors were restricted to 8 hours' work per day and to 48 hours per week, and some prohibited work at night.

Only those children who, for financial reasons, were compelled to work were reported as being granted certificates in Texas, Tennessee, Kansas, Utah, and Missouri. Similar requirements probably obtained in other States.

The provisions concerning physical fitness of applicants for employment and the procedure followed in making physical examinations will be covered separately in the discussion to follow.

Records required for certificates.—An employment certificate is issued in most States only after one or more prescribed forms have been received and approved by the issuing official. These documents differ widely in different States, depending on the legal requirements in force. They may include proof of age, school record, certificate of physical fitness, as well as a promise of employment. In some States evidence of mental condition, hours of employment, financial status, and certain other data must be presented. These may all be entered on a single form, as in Texas, or on separate forms for each item, as in Massachusetts and Oklahoma, and are usually kept on file by the issuing officer or at the continuation school.

No attempt will be made to describe in detail the various forms prescribed by each State, further than to illustrate with a few examples.

In Baltimore, of 5,784 certificates issued to new applicants in 1923, the following were accepted as proof of age: Official birth records, 2,250; religious records, 2,662; passports, 45; affidavits, 827. In Tennessee age might be established by birth certificate, baptismal certificate, Bible record, passport, or certificate of two physicians.

³³ Among these were Colorado, Connecticut, Delaware, Maryland, Massachusetts, Michigan, Oklahoma, Rhode Island, Tennessee, Texas.

In Oklahoma any one of these proofs, or the evidence presented by an insurance policy, was accepted.

Syracuse and Wilmington reported that the parents' consent was required. Louisville required a certificate of vaccination against smallpox. In Texas the county judge issued a certificate on an affidavit that the child met certain specified requirements.

Refusal of certificates.—The grounds for refusal to issue certificates are of interest. In Baltimore 379 children were refused permits in 1923, of which 44 per cent were below legal age, 13.5 per cent below grade, 17.7 per cent below standard of physical development, 5.5 per cent for failure to pass the educational test, 15.6 per cent for wanting to work in forbidden occupations, and 3.7 per cent for wanting to work during forbidden hours. In Norfolk 31 certificates were refused in 1923 for under age, 6 for forbidden occupations, 16 on account of forbidden hours, but apparently none because of lack of physical fitness. In Knoxville about 500 certificates were refused in 1923, most of these because sufficient evidence of financial stress was not shown.

PHYSICAL EXAMINATIONS

Reasons for examination.—One of the most important of the provisions of the child labor laws, enacted for the protection of minors in industry, is the requirement of physical fitness for employment in general and for the occupation selected in particular. But the difficulty of determining physical fitness has made age the most universally accepted standard.

The question at once arises, "What constitutes a reasonable physical standard?" The differences of opinion existing on this matter are well illustrated by the vast variety of legal requirements in force in the several States. To obviate this difficulty, the United States Children's Bureau appointed a committee to formulate standards of normal development and sound health for the use of physicians in examining children entering employment and children at work, and the committee has issued a preliminary report of its findings (Children's Bureau Publication No. 79), calling attention to the urgent need for a thorough, scientific study of the occupations into which young persons enter and the effects of particular occupations upon their health and strength.

Requirement of examination.—Laws enacted up to 1924 in all but 19 States³⁴ recognized the need for some consideration of the health

³⁴ Arkansas, Colorado, Georgia, Idaho, Kansas, Louisiana, Mississippi, Montana, Nevada, New Mexico, North Dakota, South Carolina, South Dakota, Tennessee, Texas (requires affidavit of parent that child is physically fit for the work selected), Utah, Vermont, Washington, Wyoming.

of the child who leaves school to enter industry. Only 23 States made a physical examination mandatory before regular employment certificates might be issued. In Oregon such a requirement was established not by law but by regulations of the State Board of Inspectors of Child Welfare, while in Ohio a record of previous examinations by the school physicians might be accepted at the discretion of the issuing officer. The other 6 States³⁵ and the District of Columbia made the requirement of examination optional with the issuing officer. Wisconsin, in the last group, operated under an optional law everywhere except in Milwaukee, where a physical examination was mandatory by a ruling of the State industrial commissioner.

No physical examinations were made in 1923 in 21 cities,³⁶ although four of these (Flint, Memphis, Nashville, and Knoxville) reported that examinations were made in rare instances when the age of the applicant was in doubt. In this group were two cities (San Diego and Youngstown) operating under mandatory State laws, and three cities (Flint, Omaha, Tulsa) having optional State requirements. Physical examinations were made under certain conditions in 6 cities—when deemed necessary, in Indianapolis, Grand Rapids, Jacksonville, and Oklahoma City; while in Fort Wayne and Atlanta, school examination records were used as a basis for issuing certificates and examinations were made only in special cases. For three cities (Savannah, Des Moines, Harrisburg) there is no information regarding examinations, though the State laws in the last two are mandatory. In the remaining 70 cities physical examinations were reported as regularly made of applicants for employment permits, even though in two of these (Washington and Detroit) State requirements were optional only, and in one city (Seattle) there were no State provisions.

Scope and purpose.—In the 30 States which, in 1924, had a mandatory or an optional requirement of physical examination of applicants for regular employment certificates, the examining physician was required to certify to one or more of the following conditions regarding the child: Normal development, sound health, and physical fitness for the intended work. Where the examining physician must certify to physical fitness for the intended work the presentation of a promise of employment setting forth the occupation at which the child was to be employed was usually required, either specifically or by implication. In three of the States (New Jersey, Ohio, and Rhode Island) the physician

³⁵ Florida, Maine, Michigan, Nebraska, Oklahoma, Wisconsin.

³⁶ Denver, New Orleans, Dallas, Fort Worth, Houston, Kansas City, Kans., Omaha, Salt Lake City, San Antonio, Spokane, Tacoma, Tulsa, Youngstown, El Paso, Evansville, San Diego, Wichita, Flint, Memphis, Nashville, Knoxville.

must certify to physical fitness not only for the intended work but for any occupation in which the child may legally engage. In Connecticut the physician was required to indicate on the certificate the kind of work best suited to the child.

Of the 76 cities where physical examinations were made, either regularly or under certain conditions, the scope of the examination was reported as "complete" in 41 cities; four cities³⁷ reported it as "fairly complete"; 12 cities³⁸ made a "general" physical examination; 6 cities³⁹ merely stated that the examination was for the purpose of determining the physical fitness for the work selected; in 4 cities⁴⁰ the scope of the examination was left to the judgment of the examining physician; Louisville and Birmingham reported only a superficial inspection, but doubtless some others belong in this category. Jersey City examined for "everything except vision." The examination was reported as "not complete" in Sioux City, and in Bridgeport as "semicomplete, not stripped." For the remaining 4 cities⁴¹ the scope of the examination was not reported.

Of the cities reporting a "complete" examination, only three (Camden, Toledo, Wilkes-Barre) qualified with the words "same as for school examination," but other cities probably followed a similar procedure, although it is doubtful whether a school examination answers the question of fitness for the occupation selected. South Bend alone reported that clothing was removed, but presumably others reporting a "complete" examination adopted this procedure. The examination in New Bedford was described as complete for boys, limited for girls; while in St. Joseph, where it was recorded as complete, the statement was made that "not much weight is given to the physical examination, action being based chiefly on age and school record." For both Lawrence and Wilmington the surveyors stated the examination could be made more thorough. In Canton the force was considered inadequate to determine accurately the physical fitness in each case. In Birmingham the physical examination is not taken seriously; the attendance officer "looks the child over," and generally no further examination is made except for measuring, etc.

Obviously it is difficult to form any opinion from these statements as to the thoroughness of the examinations. Examination blanks frequently contain considerable detail regarding the physical fitness of the applicant. Perfunctory examinations and incomplete medical certificates defeat the purpose of this requirement. In order to

³⁷ Hartford, New Haven, Norfolk, Waterbury.

³⁸ Dayton, Elizabeth, Oakland, Paterson, Richmond, Baltimore, San Francisco, Seattle, Wilmington, Allentown, Canton, Fort Wayne.

³⁹ Minneapolis, Lowell, Oklahoma City, Springfield, Lawrence, Manchester.

⁴⁰ Fall River, Portland, Worcester, Somerville.

⁴¹ Lynn, Indianapolis, Grand Rapids, Atlanta.

properly certify an applicant the examiner should be familiar with the hazards of the intended occupation.

Examining physician.—In the States which had made some legal provision for physical examination of children applying for work permits the local examiner designated by law was, according to the Children's Bureau (Publication No. 79), either the school physician, a health officer, or any practicing physician, although in some States the choice of examiner was left to the issuing officer. The local health department was the mandatory or optional examining agency under the laws of at least 16 of the 30 States in which physical examinations were made.

In most of the 76 cities where physical examinations were conducted these were made by the school physician, working under either the health department or the school board. The examiner was reported as an employee of the health department in 23 cities,⁴² and of the board of education in 29 cities. In 3 cities (Kansas City, Mo., Reading, St. Joseph) examinations were made by either the school-board physician or a private practitioner, in 4 (Fall River, Lynn, Worcester, Wichita) by either the health department or a private physician, and in Portland by either the county health officer or a family physician. In 4 cities (Hartford, New Haven, Providence, Waterbury) the examining physician was appointed or designated by the State board of education, and in 2 (Baltimore, Wilmington) by the State labor department. Seven other cities⁴³ provided no public physician for examinations, these being made entirely by private physicians, although one of these cities (South Bend) reported that the examination fee of \$2 was paid by the board of education. The examiner in Jacksonville was reported to be the county physician, in Seattle the school attendance officer (probably an error), and in Paterson the registrar of vital statistics of the health department. The city health department was, therefore, the mandatory or optional examining agency in 28 of the 76 cities where physical examinations were made.

Reexaminations.—Reexamination of a child upon change of occupation or position or at regular intervals until beyond the certificate age limit was required in certain States to enforce the provision that the child be physically fit for the work at which he is employed. It serves to extend the protection which the original examination offers, and may be used to follow up the effect of a given occupation on the child's health. A further opportunity for reexamination or supervision of the health of employed adolescents is provided for

⁴² Albany, Atlanta, Bridgeport, Buffalo, Cambridge, Dayton, Detroit, Grand Rapids, Lawrence, Louisville, Lowell, Manchester, Milwaukee, New Bedford, New York, Norfolk, Richmond, Rochester, Schenectady, Syracuse, Troy, Utica, Yonkers.

⁴³ Allentown, Indianapolis, Scranton, Sioux City, Somerville, South Bend, Springfield.

by the compulsory part-time continuation schools. Twenty-six States had laws of this type.

It is not altogether certain that the data given in the schedules correctly differentiated in every case between reexamination on change of occupation and reexamination on change of employment. When a child goes to another employer, with or without an attending change in occupation, the requirement of obtaining a new certificate, hence a reexamination, is easily enforced. But when the employer puts the child on different work from that specified on the certificate, the requirement of a reexamination on change of occupation is practically unenforceable.

Reexaminations were reported as regularly made in 25 cities,⁴⁴ both on change of occupation and on change of employment. Seven cities⁴⁵ reexamined on change of occupation, but not on change of employment, while two others (Rochester and Fall River) reexamined only on change of employment. In several other cities reexaminations were made only on certain occasions, as follows: In Oklahoma City and Grand Rapids reexamination, like the original examination, was optional with the issuing officer, hence very few, if any, were made; Cleveland reexamined on change of occupation if more than a year had elapsed since the last examination, and on change from temporary to permanent employment if three months had elapsed; Hartford and New Haven reexamined on change from an unrestricted to a restricted occupation, while Waterbury (in the same State) reported that reexaminations were made on change of employment "if necessary." Reexaminations were made of those granted provisional or temporary permits in Milwaukee, Washington, Trenton, and a few other cities. For New York and Pittsburgh no information was given regarding reexaminations.

In addition to reexamination on change of employment and occupation, Norfolk and Richmond reexamined all certificate holders annually and St. Louis quarterly, Bridgeport reexamined those granted restricted permits, and in Chicago the health of working children attending continuation schools was supervised by three medical examiners working one week per month. Probably other cities offered similar opportunities for periodic reexaminations in their continuation schools. Cincinnati made periodic annual reexaminations, but none on change of occupation or employment.

The reexaminations described above are not to be confused with those made of children reapplying for certificates after refusal on account of defects.

⁴⁴ Baltimore, Boston, Chicago, Los Angeles, Philadelphia, San Francisco, Columbus, Toledo, Akron, Bridgeport, Dayton, Duluth, Lowell, Lynn, New Bedford, Norfolk, Richmond, Scranton, Springfield, Wilmington, Canton, Peoria, Schenectady, Somerville, Wilkes-Barre.

⁴⁵ Detroit, St. Louis, Erie, Reading, Allentown, Lawrence, South Bend.

Scope of reexaminations.—Most cities making reexaminations reported these as having the same scope as the original examination used as a basis for issuing certificates. Seven of these cities further indicated that the reexaminations were “complete.” In Fall River the scope of the reexamination was left to the examining physician. In Lawrence it included heart, lungs, throat, and nutrition.

The scope or purpose of the reexamination was expressed in different terms, but usually it seemed to be to determine the physical fitness of the child to continue work and to make sure that no injury to health had occurred. Sometimes physical defects not apparent at the first examination are revealed on a later reexamination, and the opportunity is then offered for corrective measures.

Volume of examinations and work permits.—The figures reported in the survey schedules as representing the number of original examinations made in 1923 of applicants for working papers, the number of reexaminations made, the number of certificates issued, and the number of certificates in force, although sometimes incomplete or approximate, afford a fair conception of the volume of work involved in the administration of the employment certificate system. These figures are presented on the comparable basis of population in Table I, summarized by population groups. For each item is shown the number of cities for which figures were available.

TABLE I.—*Physical examinations, reexaminations, employment certificates issued, and certificates in force, per 100,000 population, 1923*¹

Population group	Number cities making examinations	Number original examinations		Number reexaminations		Employment certificates issued		Certificates in force	
		Number cities	Per 100,000 population	Number cities	Per 100,000 population	Number cities	Per 100,000 population	Number cities	Per 100,000 population
I.....	12	11	736	11	293	11	782	8	655
II.....	14	11	794	9	325	13	774	5	1,130
III.....	35	23	656	16	388	27	1,072	11	965
IV.....	15	9	617	7	261	11	852	8	752
All.....	76	54	727	43	293	62	825	32	768

¹ All figures are exclusive of vacation permits and street trades badges.

The average number of original examinations made per 100,000 population was 727, cities of Groups I and II showing slightly higher averages than those of Groups III and IV. Less than half as many reexaminations were made, the average being 293 per 100,000 population, and the variation showed no significant relation to size of city. An average total of 1,020 examinations and reexaminations is indicated per 100,000 population.

The average number of employment certificates issued in 1923 was 825 per 100,000 population, with somewhat higher averages for

cities of Groups III and IV than for those of Groups I and II. It appears, then, that the smaller cities issue more employment certificates, but make fewer examinations, in proportion to population, than the larger cities.

There seems to be no significant relation between size of city and the number of certificates in force at any one time. Obviously, some certificates are continually being canceled by children quitting work or passing beyond the certificate age limit or for other reasons.

DISQUALIFYING DEFECTS

Permanent disqualification.—In general, the practice of refusing certificates permanently for irremediable defects and temporarily for correctible defects was followed by most of the cities having physical requirements. Quite often the list of disqualifying defects was not completely reported in the survey schedules, either because of lack of space or for other reasons.

Among the 76 cities where a physical examination must or might be made, there were 40 cities reporting that certain specified physical defects permanently disqualified the applicant for an employment certificate. Three of these (Chicago, Minneapolis, St. Paul) expressly stated that the standards of the Children's Bureau were followed. Baltimore reported rejecting permanently for noncorrectible defects, but did not specify these defects. No specified list of defects was used in 24 cities,⁴⁶ of which 10⁴⁷ reported that the matter was left to the discretion of the medical examiner, and 4⁴⁸ stated that it depended on the intended occupation. The remaining 11 cities⁴⁹ did not report on this inquiry.

More cities specified cardiac and lung (or tubercular) conditions as permanently disqualifying an applicant for an employment certificate than any other defects—26 cities for cardiac and 24 for pulmonary. Other conditions reported as causes of permanent refusal included defective vision in 13 cities; malnutrition⁵⁰ in 10; goitre, trachoma, and deafness in 5 cities; Graves disease, syphilitic, or tuberculous disease of bones and joints, defective teeth, chorea, immaturity, under standard height or weight for age,⁵¹ hernia, kidney

⁴⁶ Atlanta, Elizabeth, Grand Rapids, Jacksonville, Oklahoma City, Providence, Springfield, Syracuse (continued poor physique and poor health), Dayton; also the cities enumerated in footnotes 47 and 48.

⁴⁷ Cincinnati, Kansas City, Mo., Seattle, Washington, Akron, Duluth, Fall River, Manchester, St. Joseph, Somerville.

⁴⁸ Columbus, Portland, Allentown, Canton.

⁴⁹ Pittsburgh, Jersey City, Louisville, Albany, Lynn, Paterson, Utica, Worcester, Yonkers, Schenectady, Troy.

⁵⁰ Minneapolis specified malnutrition equivalent to grade 4 in the Dumfermline scale as permanently disqualifying, and grade 3 as temporarily disqualifying.

⁵¹ And, in the case of Minneapolis, unmistakable signs of adolescence, such as the following: For girls, menstruation, presence of the four second molars, presence of kinked pubic hair; for boys, same except change of voice instead of menstruation.

conditions, and nephritis in 4 cities; anemia in 3 cities; nervousness and deformity in 2 cities; and each of several others⁵² in 1 city. Various vague conditions were also mentioned, such as organic or constitutional disease by 3 cities, chronic or active disease by 4, general or total physical disability by 4, and organic pathology by 1 city.

A permanently disqualifying defect is understood to mean one for which an applicant is refused a permit irrespective of his willingness to take up a different occupation or to place himself under treatment. Yet it is conceivable that a number of the defects enumerated above as causes of permanent rejection might be remediable, and that after correction such children could legally be eligible for a permit. It is, therefore, difficult to determine from the reports received the precise practice in vogue. How thoroughly the examiner looks for the specific defects mentioned in the schedules, and how conscientiously he abides by his findings, are matters concerning which no appraisal can be made. One thing is certain, namely, that only a negligible percentage (0.69) of those examined were permanently refused work permits because of physical defects.

Limited permits.—Certificates limiting the holder to certain occupations, or prohibiting him from engaging in specified types of employment, were issued in the following cities: Cleveland, in incorrigible cases of heart and lung conditions, reexamination being required at intervals; Cincinnati, when the examiner considered the applicant's condition suited only to certain occupations; Milwaukee, chiefly on account of cardiac defects, such permits constituting about 1 per cent of all work permits issued in 1923; Bridgeport, where one kind of certificate limited the holder to light work out of doors, another to employment not about moving machinery, and a third to part-time work under supervision, all being required to report for reexamination at designated times; Dayton, to all those having defects that would ordinarily permanently disqualify an applicant; and in the remaining three cities—Philadelphia, Toledo, Reading—a permit for work about power-driven machinery was refused because of epilepsy, loss of one leg, arm, or eye, defective vision, or defective hearing.

Temporary disqualification.—Of the 76 cities making physical examinations, 35 reported certain specified remediable physical defects as disqualifying the applicant for a work permit pending correction. Only 3 of these—Chicago, Minneapolis, and St. Paul—expressly stated that the standards of the Children's Bureau were followed. Five cities^a rejected temporarily for correctible defects,

⁵² Contagious eye and skin diseases, syphilis, pellagra, diseased tonsils, contagious disease.

^a Baltimore, Cincinnati, Indianapolis, Kansas City, Mo. (also for infections), Wilkes-Barre.

but did not specify these defects. No specified list of defects was used as a basis for temporary refusal in 26 cities,⁵³ of which 8⁵⁴ reported that the matter was left to the discretion of the medical examiner, and 3⁵⁵ stated that it depended on the intended occupation.

The remaining 10 cities⁵⁶ did not report on this item.

Where proper facilities are available for treatment, the policy of temporarily withholding the work permit until the defects are corrected or the child's condition is improved exerts a powerful influence toward improving the health status of these children. This policy also encourages parents to comply with the recommendations of the school health service prior to the application for a work permit.

Defective vision, defective teeth, and diseased tonsils were the most frequently mentioned causes for temporary refusal of working papers. Twenty-nine cities specified defective vision, 23 cities teeth, 18 cities tonsils, 14 cities hernia, 11 cities malnutrition, 8 cities nasal obstruction, skin diseases, and defective hearing or ear conditions, 7 cities underweight, 6 cities adenoids, 4 cities lung conditions, orthopedic defects, and nervous diseases, 3 cities heart conditions and contagious diseases, 2 cities goiter and gonorrhea, and each of several other defects⁵⁷ was specified by single cities. Various vague conditions were also mentioned, such as poor physical development by two cities, poor health by one city, and "other disabling conditions" by one city.

A large proportion (22.8 per cent) of those examined were temporarily refused certificates or were granted provisional permits. The relative frequency of occurrence of the various types of defects may be illustrated by the experience of a few cities. Defects were found in 44.7 per cent of the 12,810 examinations and re-examinations of applicants in Boston between September, 1922, and June, 1923, and of the 7,397 individual defects 38.2 per cent were dental. Of the 37,321 applicants given a first examination for regular work permits in New York in 1922, 6,608 (17.7 per cent) were temporarily rejected for physical conditions and only 325 (0.9 per cent) were permanently rejected. Of those temporarily rejected in this city the distribution by cause was as follows: For defective teeth, 53.2 per cent; vision, 34.9 per cent; tonsils or adenoids, 8.2 per cent; malnutrition, 2.8 per cent; contagious skin diseases, 0.8 per cent;

⁵³ Atlanta, Dayton (those manifestly interfering), Elizabeth, Grand Rapids, Jacksonville, Lowell, Norfolk (minor defects), Washington (all serious defects), Oakland (acute infections), Oklahoma City, Paterson, Richmond (minor defects), Lawrence (convalescence from serious illness), Peoria, Sioux City; also those in footnotes 54 and 55.

⁵⁴ Portland, Akron, Duluth, Fall River, Springfield, Manchester, St. Joseph, Somerville.

⁵⁵ Seattle, Allentown, Canton.

⁵⁶ Pittsburgh, Louisville, Albany, Lynn, New Bedford, Utica, Worcester, Yonkers, Schenectady, Troy.

⁵⁷ Respiratory diseases, faulty posture, glandular tuberculosis, anemia, not vaccinated, hookworm, and lues.

and all others (contagious eye diseases, not vaccinated, and hernia), 0.1 per cent. Of those permanently rejected in New York the distribution by cause was as follows: For cardiac disease, 92.1 per cent; malnutrition, 4.6 per cent; trachoma, 1.5 per cent; pulmonary disease, 0.9 per cent; and chorea, 0.9 per cent. In Milwaukee, where provisional permits were issued to 80 per cent of all applicants in 1923, such action was based on defective teeth in 55.7 per cent of the cases; tonsils, 9.9 per cent; malnutrition, 7.6 per cent; vision, 5.7 per cent; underweight, 4.4 per cent; heart disease, 3.6 per cent; immaturity, 2.8 per cent; adenoids, 2.2 per cent; goiter, 1.4 per cent; and all others 6.7 per cent.

Provisional permits.—Some cities have adopted the policy of granting provisional permits for a limited period to applicants having remediable defects which can not be corrected at once or where delay in correction will not seriously affect health. Such children are usually required to report for reexamination at the expiration of the provisional period, at which time an unrestricted permit may be issued if defects have been corrected, or the provisional permit may be renewed for a second limited period so as to permit the completion of treatment still under way, or a permit may be refused if no conscientious effort has been made to correct defects. This policy, it was claimed, gives the child an opportunity to earn while receiving necessary treatment, and it was believed to be fairer and to accomplish more than the refusal to issue permits pending treatment.

Only nine cities⁵⁸ expressly reported the issuing of provisional certificates, but there were probably others that pursued this policy. So far as can be determined, seven of these did not limit such temporary certificates to any one defect, but New Bedford issued them only for hernia and Reading for malnutrition. In 1923 three cities (Cincinnati, Washington, and Birmingham) granted provisional permits to all applicants with remediable defects. In Milwaukee provisional permits were issued to 80 per cent of all applicants, in Cleveland to 75 per cent, and in Minneapolis to 27 per cent.

Prevalence of disqualifying defects.—A considerable proportion of the cities in which examinations were made in 1923 reported (1) the number of applicants who were permanently refused certificates or were granted limited permits, (2) the number from whom permits were temporarily withheld or who were granted provisional permits pending correction of defects, and (3) the number of those included under (2) who were subsequently granted unrestricted certificates after defects were corrected. These figures, though not accurate and complete in all cases, afford some idea regarding the

⁵⁸ Cleveland, Cincinnati, Milwaukee, Minneapolis, Washington, Birmingham, New Bedford, Reading, Trenton.

prevalence of serious and of remediable defects found among applicants for working papers. They are presented in Table II, summarized by population groups, the number of cities reporting being shown for each item.

TABLE II.—*Proportion of applicants given original examination for employment certificates who were physically disqualified, 1923*¹

Population groups	Permanently re- fused or granted limited permit		Temporarily with- held or granted provisional permit		Unrestricted permit subsequently granted	
	Number cities	Per cent of those examined	Number cities	Per cent of those examined	Number cities	Per cent of those tempora- rily dis- qualified
I.....	7	0.42	11	22.7	8	74.5
II.....	7	.96	6	43.6	6	86.6
III.....	15	1.84	17	10.8	11	82.4
IV.....	6	.71	6	6.3	6	90.2
All.....	35	.69	40	22.8	31	77.5

¹ Figures refer to certificates for work during school hours, not to vacation permits or street trades badges.

Only 0.69 per cent of those examined for the first time were permanently disqualified or granted a limited permit because of physical defects. Although the figure is somewhat higher in cities of Group III and lower in those of Group I, there is no significant correlation with size of city.

A much larger percentage (22.8) of those examined in 1923 was temporarily disqualified or granted provisional permits pending correction of defects. In this item there was considerable variation among the population groups. Generally speaking, the larger cities (Groups I and II) temporarily disqualified a much higher proportion of applicants on account of remediable defects than did the smaller cities (Groups III and IV).

Most of those temporarily disqualified must have had their defects corrected, for 77.5 per cent of those so disqualified were subsequently granted unrestricted permits. These percentages, though highest in Group IV and lowest in Group I, show no marked relation to size of city.

CONCLUSIONS

Leadership in promoting the health of the child who leaves school to go to work has been assumed rather more definitely by those interested in child-labor reform than by public-health leaders. Efforts for prohibitory legislation concerning children in industry seem to indicate a tendency to secure health protection rather than health service and health education. No doubt, much has been accomplished through minimum age laws, educational requirements,

regulation of hours, night work, and dangerous occupations, and the physical examinations of applicants for work permits, but there still remains a serious need for more health education and follow-up health service for this important group of child population which is so dependent on good health for wage earning and self-reliance.

The United States Children's Bureau has contributed greatly to higher standards both in legislation and administration through reports on laws and methods of administration and studies of the hazards and conditions of employment. The minimum standards for children entering employment adopted at the Washington and Regional Conferences on Child Welfare called by the Children's Bureau in 1919 have indicated the trend toward which much of the legislative activity has been directed. The report of the committee appointed by the Children's Bureau to formulate standards of normal development and sound health for the use of physicians in examining children entering employment and children at work (Publication 79) should find greater use in the development of the examination service in practically all the cities.

In many of the States the laws under which an examiner acts are so worded that he may not declare a child physically unfit for a specific job. In such cases "bluff" or persuasion and education are the only measures left for enforcing the correction of defects.

Greater attention to health education and advisory health service in the continuation schools appears to offer the most practical approach to this problem. Of course the motive for leaving school is frequently ill advised from the standpoint of the welfare of the child. For those children, however, who because of mental limitations or psychological or social maladjustments are unable to profit from the schooling offered, and where the social forces are unable to cope with these problems the vocational guidance and health supervision of the continuation school appear to be much more helpful than either age or physical fitness standards that prohibit employment. The laws specifying physical fitness for the work for which the child is to be employed place the burden of proof on the examining physician, who should withhold a work permit because of physical handicaps that menace the future well-being of the child. Undoubtedly many of the work permits are withheld on insecure grounds rather than on the basis of legal regulations or the physical needs of the child. Health education in the continuation school should become more and more effective in promoting the health of children in industry.

X. MENTAL HYGIENE¹

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Traditionally in affairs concerning public health the official agencies of the State, the county, and the municipality have been restricted in their activities to the tried and the proven. To the private organizations in this field, supported by other than public funds, has been allotted the task—and the fascination—of trial and experimentation. This helps perhaps to explain why mental hygiene, as the latest of the Nation's great public health movements, still is negligibly represented among the official activities of municipal health departments.

On the other hand, perhaps no other branch of public health has been welcomed so rapidly by private health and welfare agencies as mental hygiene. Despite its incompleteness and with a full realization of its only partial emergence from the experimental stage, these nonofficial organizations found many of the methods of mental hygiene peculiarly applicable to certain of their problems. It offered a new approach to the solution of perplexing cases of a socio-medical nature and it was not long before the mental hygiene point of view was reflected in the health-education and case-work methods of a growing number of private agencies of national importance.

Psychiatric developments of the past few years lead to the conviction that the time has now come when mental hygiene no longer need be classed as a purely experimental venture. To be sure, new

¹The author of this chapter on mental hygiene deplors the inaccuracy and lack of completeness characterizing much of the data on which he has been requested to base his report. By the omission of essential facts the present survey indicates that public-health officials are often profoundly unfamiliar with certain psychiatric facilities in their own communities that are matters of rather common knowledge in other parts of the country. Moreover, no returns of any sort have been made for nearly a dozen cities possessing psychiatric facilities that have a national reputation for efficiency and therapeutic quality of work. (In conducting the field surveys the investigators collected such information and facts concerning mental hygiene activities as was available at the office of the health department. For this reason, and especially in those cities in which there was practically no liaison between the central health authorities and those engaged in psychiatric activities, very little data was collected.)

Because of these omissions and inaccuracies this chapter on mental hygiene should not be depended on to furnish the reader with an authentic or a complete picture of the psychiatric situation as it actually exists in each of the cities included in the general study. In certain instances where the author has had personal knowledge of facilities not mentioned in the data supplied he has added these for the sake of greater accuracy, but these instances are not sufficiently frequent to neutralize the inaccuracies that pervade the data as a whole.

processes and techniques still are being worked out, but it would seem that a sufficient body of proven facts has already been acquired to justify the inclusion of this medical specialty among the official activities of governmental health departments.

MENTAL HYGIENE ACTIVITIES OF PUBLIC AND PRIVATE AGENCIES

Among the cities from which the data for this report were collected, none shows a department of mental hygiene included in its official health department activities. In the 1923 report Newark and Syracuse were listed as possessing such departments in their municipal health work, but since that year these activities have been taken over by other agencies.

As a result the mental hygiene needs of the cities mentioned in this report are being met (when they are met at all) through the psychiatric facilities of boards of education, juvenile and probate courts, out-patient clinics from various private health and welfare organizations, such as mental hygiene societies, children's aid societies, district nursing associations, and so forth. It is obvious that not all of these groups are essentially medical in nature, or indeed, in some instances, even medically directed. Consequently misapplication of effort and method sometimes results, and although mental hygiene has a keen appreciation of the importance of social, environmental, and other nonmedical factors in its diagnostic and therapeutic activities, yet the foundation of mental hygiene always rests on medical science, and any mental hygiene clinic to function properly requires the direction of a medically trained psychiatrist.

According to the data available for this report, a wide variety of machinery exists among the various States for the promotion of mental health and the prevention of mental disease. Unfortunately, the data are not sufficiently complete and accurate to treat the matter statistically. In general, however, it is evident that several varieties of mental ill health are officially recognized by State or municipal health departments and more or less separate provision made for their treatment or care. Thus every State has one or more institutions for the frankly insane. Most States have at least one institution for the feeble-minded, and a few have special institutions for the epileptic and also for defective delinquents. Several States, notably Massachusetts, New York, Pennsylvania, Illinois, and New Jersey, maintain central departments of mental disease under which all State hospitals, schools for the feeble-minded, and other institutions for mental cases are placed. A number of other States place such institutions under the auspices of State boards of charity.

Institutional care of mental patients has been made largely a function of the State with the exception of those cases treated in private

sanitaria or in sectarian institutions. In a few instances the county is still the governmental unit that undertakes the care of mental patients, although this practice is not frequent. A few cities make such provision. Detroit, for example, still cares for many of its senile and chronic mental cases at the Wayne County Infirmity at Eloise.

Out-patient clinics maintained exclusively for the feeble-minded appear to be increasing in number. These are usually conducted under the auspices of State schools or colonies for defectives, school boards, or in some instances by private agencies. The majority of clinics of this nature appear to be largely diagnostic in function. Relatively few are equipped with sufficient trained workers to undertake the task of adjustment and supervision of those defectives who have been given some institutional training and who are capable of being returned to their communities to utilize their training in a gainful way. School clinics for backward children, especially, appear to make but little effort to do more than give intelligence tests and on the results of these to assign suitable children to special classes.

From the data at hand it appears that the personnel of these clinics for the detection of cases of subnormal intelligence varies widely. Some clinics are staffed by a psychiatrist only, while others possess in addition one or more social workers and psychologists. The training of such social workers likewise varies, only a relatively few being graduates of schools for psychiatric social work, such as the Smith College school for social work or the New York school of social work. Psychologists of all degrees of training are found in many clinics. Indeed, so far as public-school clinics are concerned, it is often found that no medically trained individual is in charge, the work being undertaken entirely by lay psychologists without medical supervision. Some psychologists were found to be well trained, possessing a Ph. D. degree and a background of adequate clinical experience. Others appeared to be largely self-styled, their training consisting of a major collegiate course in psychology, with more or less academic laboratory experience. Many of this latter group properly were capable only of mental testing, their meager training being insufficient to enable them accurately to evaluate test results or to interpret mental mechanisms.

The customs of private organizations engaged in conducting mental hygiene clinics ranged from the employment on a full-time basis of an adequately trained staff down to the occasional services of physicians whose primary interests lay in fields of medicine other than psychiatry. It seems significant that with the possible exception of those clinics conducted by State hospitals or State institu-

tions for the feeble-minded, no accepted standards prevail among the rank and file of clinics for the employment of psychiatrists, psychiatric social workers, or psychologists. Consequently the widest fluctuation exists in the quality of the service rendered and the results obtained. Each of these professional groups, however, is rapidly adopting standards of training, and with the increase in trained personnel, accompanied by higher standards of employing organizations themselves, a better and more uniform grade of work may be expected.

In demanding for mental clinics a high standard of training for the professional members of their staffs the National Committee for Mental Hygiene, from the very inception of such work, has taken an important stand. Largely as a result of the insistence of this organization on the adoption of and the adherence to uniformly high standards the more progressive private health and social agencies of the country are now accepting the national committee's recommendations for minimum qualifications of a mental clinic. These consist of the following essentials: That the clinic be medically supervised by an experienced psychiatrist; that its staff include an adequate number of specially trained psychiatric social workers who, preferably, shall be graduates of recognized schools of social work giving training in psychiatric social work; and that, included on its staff, there shall be a psychologist with a training equivalent to that of a doctor of philosophy in psychology, or whose collegiate training shall have been supplemented by at least one year's clinical experience under proper supervision.

ATTITUDES TOWARD MENTAL HYGIENE

The data for this chapter are not sufficiently complete to offer an accurate estimate of the attitude of various public and private officials on the value of mental-hygiene activities in their communities. Indeed, it seems impossible correctly to gauge such an intangible matter when attitudes all too often are determined by individual emotional experiences. In general, however, the consensus of the opinions expressed in the reports would indicate that most health officers are uninformed, uninterested, and, in a few instances, antagonistic to the possible value of a mental-hygiene program in their departments. Often the feeling is expressed that they do not think of mental hygiene as a health problem but regard it instead as a purely social matter. Other statements indicate that some consider it too specialized a subject for inclusion in health-department activities; while still others are reported as declaring that not enough knowledge about mental hygiene has been discovered to warrant

spending time or money on its official promotion. So far as the attitude of public-health officials, physicians, and the lay public is concerned it is significant that, in those communities where mental hygiene societies have undertaken educational campaigns, and where an acceptable piece of psychiatric clinic work has been carried on, a distinctly favorable feeling toward the establishment and extension of clinic activities is in evidence.

VITAL STATISTICS AND RECORD KEEPING

With regard to vital statistics New Jersey apparently is the only State where certain types of mental disease are reportable. Cases of epilepsy and mental deficiency in New Jersey are required by State law to be reported to local boards of health who report them to the State board of health, which in turn notifies the State department of institutions and agencies. Mental deficiency, when diagnosed in Massachusetts, is reportable to the State Department of mental diseases. Theoretically neuro-syphilis is also reportable in many States if a rigid interpretation of the State laws requiring the reporting of venereal disease is adhered to. Actually, however, it appears that neuro-syphilis is seldom, if ever, reported in this way. Such records of mental mortality as are kept are, for the most part, collected and filed by individual State institutions for the mentally ill. States in which all mental institutions are under the supervision of a central State bureau are exceptions to this practice.

With the exception of New Jersey (as noted above) city or State health departments evidently do not gather records on this subject. For some years a movement has been on foot to induce mental hospitals throughout the country to adopt a uniform classification of diagnosis as well as standard statistical forms for other information pertinent to the subject. At present a majority of States have adopted the classification and statistical forms indorsed by the American Psychiatric Association, and the National Committee for Mental Hygiene, and recently arrangements have been made whereby the United States Public Health Service will publish weekly, in its official Public Health Reports, admission, discharge, and similar data from a large number of hospitals for the insane.

It is apparent from the information at hand that few health departments possess at present the requisite machinery to make regular reporting of mental disease either feasible or possible. Opportunities for health officers to come in contact with mental disease officially are still too limited to expect them as a group to have more than a perfunctory interest in recording their types or incidence. Any attempt to compel private organizations to report cases coming

to clinics conducted under their direction would probably meet with protest at this stage of public education concerning mental illness. The average citizen still is inclined to think of mental disease in medieval terms, and it has taken much patient work to dispel his suspicions about the usefulness of mental clinics. It is likely, therefore, that reporting of all adults and children attending such clinics might possibly be followed by a serious reduction in their use.

FACILITIES FOR PROMOTING STUDY OF MENTAL HYGIENE

Twenty-five cities reported that psychiatry was taught in local medical schools. It is evident, however, that in many instances the use of the word "psychiatry" was misinterpreted, for reports from other sources indicate that "nervous and mental diseases" is the title usually assigned to this subject in medical schools. Chairs of psychiatry are established at the medical schools of Harvard, Johns Hopkins, University of Michigan, University of Iowa, Cornell University, University of Colorado, and Columbia University.

Boston, Albany, Denver, Washington, Baltimore, New York, Iowa City, and Ann Arbor (for Detroit and Michigan at large) also report local psychopathic hospitals, where teaching is carried on in connection with medical schools, and other medical training centers.

In nurses training schools.—The teaching of "psychiatry," "nervous and mental diseases," or "mental hygiene" in nurses training schools is by no means universal. Information is not available from this present survey to permit an accurate estimate, but it is known that with few exceptions such teaching is restricted to a small number of lectures on nervous and mental disease, supplemented in some cases by several months of reciprocal service in a State hospital. One or two nursing organizations, notably the Community Health Association of Boston, have made efforts to instruct their graduate nurses in the social and community aspects of psychiatry, but this practice is exceptional.

Training special-class teachers.—Twenty-one cities (Allentown, Baltimore, Birmingham, Buffalo, Boston, Dayton, Detroit, Duluth, Fall River, Jersey City, Los Angeles, Minneapolis, New Bedford, New Haven, New Orleans, New York, Providence, St. Paul, San Francisco, Springfield, Mass., and Washington, D. C.) reported facilities for training public-school teachers for pedagogic teaching of "under-averaged children." Some of these facilities, as in Allentown, are furnished by the State department of education; others are supplied by State normal training schools. New York and Detroit have teachers colleges which offer this special training, while Minneapolis and St. Paul have practice schools under the direction of a staff from the University of Minnesota.

There is no indication of any standard of training in the assignment of teachers to special classes for training backward or defective children. Some cities appear to insist on certain minimum psychologic requirements for applicants for such positions, while in many others teachers with little or no special training are appointed. Here again is demonstrated the need for additional educational work among superintendents and principals of schools. To select with more or less scientific care those children who are in need of specialized training and then to place them under the direction of a teacher having no expert knowledge of their requirements is both absurd and uneconomical. At least a minimum training standard should be fixed by each school department. Boston offers an example in this respect that might profitably be adopted by other cities. The Boston school department insists that teachers of mentally retarded children in special classes must be graduates of a high school, must have had at least one year's successful experience in teaching classes of defective children, or one year's experience in the Boston public schools as a special assistant in classes for retarded children, or must give evidence of two years' experience in the regular graded classes of the Boston public schools and successful completion of a course in instruction of mentally defective children approved by the superintendent of schools.

METHODS FOR DETECTING AND TRAINING SUBNORMAL CHILDREN IN PUBLIC SCHOOLS

In the education of mentally defective children in the special classes of the public schools a variety of methods for detecting retarded cases is disclosed. For example, Allentown and Erie, Pa., reported that all children in the public schools are given mental tests and subsequently placed in special classes, if necessary, according to the test results. In the case of Erie a note states that, "Intelligence tests are given to all beginners, all those completing the sixth grade, and all pupils finishing high schools." Six cities (Atlanta, Baltimore, Bayonne, Birmingham, Bridgeport, and Cambridge) reported that suspicious cases are referred by teachers to school psychologists or to psychiatric clinics for examination.

Children are transferred to special classes without psychologic examination other than the untrained inspection of classroom teachers, according to the reports of Camden, Elizabeth, Evansville, Knoxville (here the regular school physician performs this service), Omaha, St. Joseph, Spokane, and Tulsa. No efforts to detect mentally defective children in the public schools are made (according to the data available) in Savannah, Tacoma, Wilmington, El Paso, or San Antonio, and it must be assumed that these cities do not main-

tain special classes. In all the cities of Massachusetts a State law automatically requires the examination of all school children three years or more retarded in their work, while Buffalo goes a step further and is reported as insisting on the examination of every school child who fails to be promoted in his grades.

The establishment of special classes in New York State is made mandatory by a State law (ch. 553, Art. XX-B) passed in 1917 and reading as follows:

Children with retarded mental development.—1. The board of education of each city and of each union free school district, and the board of trustees of each school district shall, within one year from the time this act becomes effective, ascertain, under regulations prescribed by the commissioner of education and approved by the regents of the university, the number of children in attendance upon the public schools under its supervision who are three years or more retarded in mental development.

2. The board of education of each city and of each union free school district in which there are 10 or more children three years or more retarded in mental development shall establish such special classes of not more than 15 as may be necessary to provide instruction adapted to the mental attainments of such children.

The special class idea as a medium for continuing the training of mentally retarded children after they have progressed in the regular grades as far as their limitations permit can no longer be regarded in an experimental light. In a majority of the more forward-looking communities this addition to the regular curriculum has proven its worth in repeated instances. Arguments, both social and economic, for the introduction of special classes into public-school systems are so well known as to need no repetition here. Suffice it to say that these classes represent an elementary step in the mental-health program of any city.

It is apparent, however, from the reports of many of the cities mentioned in this report that unscientific practices frequently are resorted to when it comes to adopting methods of selecting and teaching defective children. Earlier reference has been made to the necessity for using only adequately trained teachers in special classes. And it is no less essential that approved psychologic methods be adhered to in selecting pupils for such classes. Haphazard transfers made by psychologically untrained grade teachers, largely on a basis of diagnostic impressions given by unusual appearance or behavior of the child is a practice that can not possibly be successfully defended. Nor is the custom of basing transfers on the recommendation of a school physician who is unacquainted with the technique of psychometric tests any improvement. The plan that insures the best hopes of identifying cases of a suitable type for transfer to special classes calls for a definitely organized program and a specially trained staff. Children who habitually

have difficulty in accomplishing grade work compatible with their chronologic age, or children who frequently give expression to trouble-making tendencies, or whose conduct is otherwise often irregular should be referred by the observant teacher for intellectual measurement to the school department psychologist or a child guidance or other mental clinic whose competency is unquestioned. Then, and only then, should transfer to the special class be made if the test results so indicate.

CLINICS FOR MENTAL CASES

Forty-four cities reported that they possessed one or more mental clinics held at frequent and regular intervals. Sixteen others reported that they have recourse to clinical service occasionally or irregularly—Erie, Cambridge (for mental defectives only), Des Moines, Duluth, Fall River, Fort Wayne, Houston, Kansas City, Kans., Knoxville, Manchester, Nashville, Omaha, Peoria, St. Joseph, Toledo, and Yonkers.

Twenty-seven cities reported that they had no mental clinics—Atlanta, Bayonne, Birmingham, Camden, El Paso, Evansville, Flint, Fort Worth, Jacksonville, Jersey City, Norfolk, Oklahoma City, Paterson, Portland, Rochester, San Antonio, San Diego, Savannah, Seattle, Sioux City, South Bend, Spokane, Tacoma, Tulsa, Wichita, Wilmington, and Youngstown.

From the data collected it is evident that these clinics, whether held regularly or irregularly, are of many types and varying degrees of usefulness. Some, as has been previously mentioned, are for the sole purpose of diagnosing defects of intelligence. For the most part these are conducted by city boards of education, by university or collegiate departments of psychology, or by staffs from State institutions for the feeble-minded.

Other clinics are conducted entirely for "problem" children who present difficulties of personality, of undesirable habit formation, or of delinquency. A smaller number of clinics are available for mal-adjusted adults who do not need legal commitment to a hospital for mental disease. Many different organizations undertake to conduct mental clinics. In addition to the school, college, or State institutional clinics recently referred to, such other agencies as county health departments, private social welfare groups, and settlement houses not infrequently maintain a service of this kind.

Many of the clinics conducted by the staffs of State hospitals restrict their work to the checking up of patients paroled from these institutions, and to occasional examination for a prospective admission. A few cities possess clinics only in connection with the juve-

nile court, where, it must be assumed, delinquent children are the sole persons to be given attention. The data available are not sufficient to permit a statistical differentiation by cities and clinics of the various age groups of persons examined, but it is clear that clinics for backward and for "problem" children greatly predominate in numbers over those for adults.

Of the 44 cities possessing frequent and regular clinics, and of the 16 having occasional ones (a total of 60), all but 15 cities reported that psychiatric service included diagnosis and treatment. On the other hand, the clinical services of the following 15 cities apparently was limited to diagnosis only—Allentown, Bridgeport, Cambridge, Dayton, Duluth, Erie, Fall River, Fort Wayne, Grand Rapids, Kansas City, Kans., Omaha, Peoria, Reading, St. Joseph, and Youngstown.

Proposed organization.—The ideal organization for a mental clinic obviously must differ with its function. For a clinic limiting its work to the testing of intelligence of school children, an experienced psychologist, aided by the necessary stenographic assistance, might well be sufficient. A State hospital clinic interested solely in the aftercare of its discharged or paroled patients might get along satisfactorily with a psychiatrist and a psychiatric social worker. But for a clinic ambitious to undertake the actual treatment of general mental maladjustments, a more elaborate organization is imperative. Here a psychiatrist, at least two psychiatric social workers, a psychologist, and an adequate amount of clerical help should ordinarily be considered the minimum equipment. Even with a staff of this size the case load will be much smaller than that of most medical clinics because of the intensive study required of nearly all patients. The salary budget for the professional members of this staff will vary, but \$12,500 per year distributed in the following manner will probably be the lowest for which competent, whole-time personnel can be obtained—psychiatrist, \$6,000; psychiatric social workers, one at \$2,400 and one at \$2,100; psychologist, \$2,400.

For the successful functioning of a mental clinic undertaking therapy the services of specially trained psychiatric social workers are indispensable. The social worker with a background of special training in social psychiatry brings to bear upon her cases an insight that frequently regards as significant numerous details of history, environment, and personality which the nonpsychiatric worker overlooks or has considered unimportant, and a technique that has been developed to meet the special type of problems with which she deals.

FACILITIES FOR MENTAL EXAMINATION OF OFFENDERS

Concerning the mental examination of court cases there is little agreement on methods or types. For adult offenders, Boston, Baltimore, Chicago, St. Louis, Cleveland, Philadelphia, and Detroit reported psychiatric clinics as officially attached to certain courts (chiefly municipal, recorders, court of common pleas, etc.).

These clinics are in charge of trained psychiatrists, and in the case of Detroit at least, this individual is assisted by a staff of psychiatric social workers and a psychologist. Six other cities (Akron, Buffalo, Los Angeles, Newark, New Orleans, New York, and San Francisco) reported official psychiatric clinics attached to their juvenile courts only. In addition Boston, Chicago, and Cleveland maintained juvenile court clinics separate from their adult clinics. Twelve cities (Evansville, Kansas City, Kans., Knoxville, Manchester, New Bedford, Peoria, St. Joseph, Savannah, South Bend, Spokane, Tulsa, and Wichita) reported that they possessed no facilities for the mental examination of prisoners or juvenile delinquents.

It is encouraging to discover that with these 12 exceptions, all the other cities included in this report apparently have some facilities for the mental examination of persons brought before the courts. To be sure these facilities often are sketchy and uncertain and there is no evidence in the data to show whether they are conducted with a proper regard for sound psychiatric technique. Nevertheless they are reported with such a presumption. For example, Youngstown and Erie state that their courts avail themselves in certain instances of the advice of the school physician, while a larger number have the custom of calling in local doctors (it is not indicated that these physicians have psychiatric experience) to examine either adult or juvenile offenders whenever psycho-pathology is suspected. Fort Wayne, Grand Rapids, Providence, Reading, Wilkes-Barre, and Worcester reported that their courts, when psychiatric examination seems desirable, avail themselves of the services of State hospital clinics (or individual staff members thereof), which are held in their communities intermittently (usually monthly). In addition to these cities, the courts of Hartford, Richmond, St. Paul, Minneapolis, Los Angeles, Memphis, Cleveland, and Philadelphia make more or less use of local private clinics.

Of all the cities contributing data to this study only Birmingham, St. Joseph, and Wilkes-Barre reported that no separate court was maintained for juvenile offenders. On the other hand, if the data can be relied upon, nine cities reported that in their juvenile courts all delinquents are given a mental examination (Allentown, Baltimore, Cincinnati, Los Angeles, Pittsburgh, Philadelphia, San Diego,

Seattle, and Waterbury). For Kansas City, Mo., Memphis, and Portland it is reported that while not all juvenile delinquents are examined, all repeaters are examined.

No instance is reported of the routine mental examination of all adult offenders, the nearest to such method being Massachusetts, where prisoners indicted for certain offenses (a capital offense or a previous conviction for a felony) are automatically referred for examination to the State department of mental disease. Massachusetts recently has gone a step further and provided for the routine examination of all prisoners in county jails and houses of correction who have been sentenced for a period exceeding 30 days.

Requirements of court clinics.—For the successful functioning of a court clinic several essentials are required. One is the interest and active cooperation of the local judiciary; or at least that part of it to which the clinic gives service. Another is a specially trained medical staff conversant with court types of psychiatric problems. A third consists in the organization of a clinic that shall be an independent body, and yet be flexible enough to cooperate intimately with probation and similar court departments.

Such a clinic should have its own trained social workers and should not be handicapped by the necessity of relying upon probation officers untrained in the clinic's methods of investigation and social treatment. At least the services of a part time and usually a full time psychologist will be necessary. The psychiatrist in charge should not neglect the need for continuing a program of education among judges, district attorneys, probation officers, and others. The method of selecting cases should preferably go beyond the passive one of examining only those prisoners referred by judges. Probation officers, court officials, and jailors should be instructed in the significance of certain symptoms with a view toward acquiring the habit of sending for examination cases other than purely obvious ones. It will doubtless be profitable if the psychiatrist himself frequently goes through the prisoners' dock, selecting for examination those who present psychiatric difficulties that have escaped the untrained eyes of nontechnical observers.

MENTAL EXAMINATION OF DEPENDENTS

No city among those included in this study reported the routine mental examination of dependents applying for public relief. San Francisco, however, reports that "dependent children" are examined by the psychiatric staffs of the juvenile court or private clinics; while in Philadelphia "all juvenile dependents are given mental examinations under the auspices of the municipal courts." In addi-

tion, Boston reports that a private agency, the New England Home for Little Wanderers, "maintains a psychiatric and psychologic staff for the examination of the children it receives." A further note states that in Boston, the "municipal division of child welfare employs a physician (with psychiatric experience) who is paid \$2 for each examination and who visits the department every day for the purpose of making physical and mental examinations of children who come under its jurisdiction."

Fifty cities reported that no mental examination is made of those adults or children seeking "poor relief." (Atlanta, Bayonne, Camden, Dallas, Dayton, Denver, Des Moines, Duluth, El Paso, Erie, Evansville, Fall River, Flint, Fort Worth, Grand Rapids, Jacksonville, Jersey City, Kansas City (Kans.), Lawrence, Los Angeles, Lowell, Lynn, Manchester, Memphis, Nashville, New Bedford, New Haven, New Orleans, Norfolk, Oklahoma City, Omaha, Paterson, Peoria, Reading, St. Joseph, Salt Lake City, San Antonio, San Diego, Savannah, Sioux City, Somerville, South Bend, Spokane, Tacoma, Waterbury, Wichita, Wilkes-Barre, Wilmington, Worcester, and Youngstown.)

On the other hand, 28 cities reported that mental examinations of those seeking "poor relief" are made when "mental defect is suspected" or when examination is indicated. (Akron, Allentown, Baltimore, Boston, Bridgeport, Buffalo, Cambridge, Chicago, Cincinnati, Cleveland, Detroit, Fort Wayne, Hartford, Houston, Kansas City (Mo.), Louisville, Minneapolis, Newark, Oakland, Portland, (Oreg.), Providence, Richmond, Rochester, St. Louis, St. Paul, Seattle, Syracuse, and Yonkers.)

So far as the attitude of official departments of charities or analogous bodies toward mental examinations for those seeking "poor relief" is concerned, many appear indifferent or even antagonistic. The department of charities of Omaha, for example, was reported as declaring that they "don't want such work done." For the most part, the private agencies dealing with problems of dependency and poverty exhibit eagerness toward the idea of mental examinations for their clients and often avail themselves of the psychiatric services of local clinics or private physicians.

There is a growing and widespread recognition among welfare and social workers that psychopathology is closely interrelated with dependency, poverty, and the need for poor relief, in many instances. This is specially apt to be true of those individuals or families whose names constantly appear on agency records over a period of years, or even generations. Feeble-mindedness, distortions of personality or character, psychopathic "make-ups," and even so-called insanity are found with increasing frequency among numerous men, women,

and children who have come to depend on public or private support for existence. It should be obvious that such individuals are handicapped in economic competition with their more highly endowed neighbors. And it should be even more obvious that to bestow regularly on them doles or other relief funds without previous knowledge of their intelligence, judgment, or industrial capacity is futile.

Some of these individuals, once a competent psychiatric examination has revealed their particular disability, may be given vocational training of a type compatible with their psychiatric condition, and restored to a basis of at least partial self-support. A vigorous clearing up of provocative environmental conditions may suffice to increase the efficiency of others. Foster homes or drastic changes in surroundings may help to solve the difficulties of the children in this group and thus prevent a later and more serious mental maladjustment. Of course, institutional care of one sort or another will be required for a goodly number of chronically dependent persons. Cases of senile or pre-senile dementia should be committed, if home care is impossible or unsatisfactory, to hospitals for the insane or to one of the more modern types of almshouses where psychiatric facilities are available. The feeble-minded, or at least those whose intellectual defect is pronounced or whose social maladjustment is marked, should be sent to State schools or colonies for defectives to be trained and then returned to their communities under adequate supervision, or segregated, if that seems necessary. Institutional care will also be desirable for certain types of psychopathically inclined adults who legally may not be insane but whose mental difficulties render them socially and economically inefficient or troublesome.

XI. INDUSTRIAL HYGIENE AND SANITATION

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In attempting to analyze the data on industrial hygiene which were obtained in 1924 in a survey of the 100 cities in the United States having a population of 70,000 or over, a general tabulation was made which set down the exact information contained in the schedule, from which it was hoped that a comparison could be drawn between the cities, following the general subheads under which the data were noted on the schedule. The first difficulty encountered was that comparative information on the subject was difficult to obtain in desired detail, owing to different interpretations of the questionnaire by those making the survey and by city health officers. Of much greater importance, however, was the fact that a large percentage of the information contained in the schedule was opinion. In obtaining the information from the health commissioner it is obvious that his exact knowledge is confined to the activities of the health department, and that many health officers have been unable to obtain definite data either relating to the industries within their cities, to the clinics and dispensary facilities maintained by those industries, or to the operation of that branch of the State government which has within it the industrial hygiene service.

There are 10 subheads in that part of the schedule relating to industrial hygiene. The first is organization, part of which relates definitely to the activities of the health department, the remainder to the activities of State and other agencies; the second relates to industrial medical service in industry; the third to legal provisions concerning industrial occupations and hazards, which largely concerns the State, except in extremely few instances where the city has definite laws relating to industrial hygiene; the fourth is the notification of industrial diseases, which in every instance is operated under State laws; the fifth relates to the investigation of cases of occupational diseases, which, in operation, is largely a State function except in some few instances where the health officer investigates sanitation of plants or industrial hazards upon the development of some of the occupational diseases; the sixth relates to occupational clinics, which are conducted by hospitals, except in one instance; the seventh, to nursing service, which is almost entirely a function of the private factory; the eighth, to sanitary inspection and control which should

relate almost entirely to the city but as a matter of fact is probably more frequently carried on by the State rather than the city; the ninth, to educational measures, which may be city, State, or national in character; and the tenth, to miscellaneous measures, which are largely State, industrial, or private in character.

It is quite clear then, as already referred to, that most of the information contained in the schedule represents the opinion of the health officer, based upon such information as he is able to gather from industries and the State government, and up to the present time a smooth working cooperation between State and city authorities has not been developed in many places to the desired extent. In the following analysis, therefore, only that part of the schedule which has to do with activity of the health department has been used, and no attempt has been made to study the information which was given either regarding activity of the State in relation to industrial hygiene and sanitation, the work of private and nonofficial agencies, or that of private factories.

In the following table the activities of the health department, upon which there should be accurate information, have been given:

TABLE I.—*Number and names of cities in each population group, arranged according to the industrial hygiene activities performed by the city health departments*

Class of city	Notification of industrial diseases	Investigation of industrial diseases	Sanitary inspection and control of factories	Authority of health officer to prevent industrial hazards	Educational measures
Group I, over 500,000 (12).	(1) New York.	(1) New York	(5) Los Angeles. New York. St. Louis. Baltimore. San Francisco.	(2) New York. Baltimore.	(2) Cleveland. New York.
Group II, 250,000 to 500,000 (16).	(1) Toledo.	(1) Newark.	(6) Louisville. Milwaukee. Newark. Washington. Kansas City, Mo. Seattle.	(2) Jersey City. Cincinnati.	(2) Newark. Cincinnati.
Group III, 100,000 to 250,000 (50).	(3) Fall River. Reading. Kansas City, Kans.	(2) Fall River. Reading.	(12) Cambridge. Des Moines. Memphis. Fall River. Nashville. Richmond. Houston. Reading. Birmingham. Jacksonville. Oakland. Paterson.	(6) Omaha. Akron. Flint. Atlanta. Paterson. Youngstown.	(11) Memphis. Nashville. Houston. Richmond. Reading. Birmingham. Bridgeport. Dayton. Norfolk. Oakland. Springfield.
Group IV, 70,000 to 100,000 (22).	(2) Allentown. Lawrence.	(2) Allentown. Sioux City.	(3) Allentown. San Diego. Fort Wayne.	(2) Sioux City. Waterbury.	(1) Sioux City.

In Group I in only one city, New York, was there actually a division of industrial hygiene. The record regarding these activities in Chicago gave no information on this point, although it is known that Chicago had a very comprehensive plan under consideration for the development of this work in that city. In New York City the division expended approximately \$71,341 per annum, and was under the direction of a superintendent. The health officer of this city has authority to prevent industrial hazards, but apparently part of the activities of the division are carried on under the State law and not under a local law. Records of all reportable occupational diseases are kept, and complete histories of cases and possible sources of industrial hazards are made by the health department. Action is taken to remove industrial hazards where found. Five occupational clinics were operated in 1923, one in each borough, by the division of industrial hygiene of the city health department. At these clinics examinations of food handlers are made, as are also examinations of industrial workers. Sanitary inspections covering both the sanitation and industrial hazards of factories in 1923 numbered 21,634. The city also carried on educational work by lectures at the factories and through posters and placards.

Of the other cities in this group of 12 having a population over 500,000, the character of work undertaken was largely that of sanitary inspection and control which, as noted from the table, was carried on in five cities.

At Baltimore sanitary inspection was done only for some special condition or on complaint of nuisance. Baltimore is also the only other city in this group where it was stated that the health officer had broad powers to prevent industrial hazards.

At St. Louis such illnesses as are reported by industries were investigated under the supervision of the health officer and his assistants. Sanitary inspections were made on complaint and at irregular intervals.

In San Francisco 7,487 inspections relating to lighting and ventilation and general sanitary conditions were made by the city health department under the direction of the board of health.

At Cleveland a course of instruction for industrial nurses was given under the supervision of the health commissioner, and some educational measures were carried on in cooperation with the State board of health.

In the second group of 16 cities, having a population between 250,000 and 500,000, Toledo is the only one which officially reported that a record of notifiable diseases was kept by the health department, although it is stated that the diseases were not investigated by the city proper.

At Newark industrial poisonings are usually reported through the city. Upon report complete record is made in each case; the person suffering from such poisoning is visited and an inspection made of the factory where the poisoning occurred. Thirty such inspections were made in 1923. Where investigation is made by the city health department the information is reported to the Department of Labor. It could not be determined definitely whether or not the city maintained supervision over the sanitary conditions in factories or whether this was left to the State.

At Louisville the health department had an industrial inspector who gave whole time to factory inspection. These inspections numbered 545 for 1923, and mainly related to the sanitation of toilets and washrooms, although they did include special inspection of dusty trades relating to ventilation.

At Milwaukee sanitary inspection was under the sanitary division of the health department and inspections were made by three inspectors detailed to this work. These inspections relate to the general sanitation and ventilation of factories.

At Washington there were 2,248 sanitary inspections of factories made under the sanitary inspection service of the city health department. The expenditures by Washington for industrial hygiene were \$5,500.

General sanitary inspections were carried on by Kansas City, Mo., and Seattle in connection with the city sanitary inspection department.

At Jersey City and Cincinnati the health officer is said to have the power of preventing industrial hazards, although at Cincinnati it is an emergency measure only. Educational measures are carried on by Newark, Cincinnati, and Minneapolis.

In the third group of cities, those having a population between 100,000 and 250,000, three reported that industrial diseases are notifiable. At Fall River only anthrax is reportable to the local board of health, all others being reported directly to the State authorities. It was stated that cases are occasionally visited by nurses and that information regarding the cause of accidents is secured. Over 1,000 inspections were made at industrial plants, and nuisances and industrial hazards were corrected. Records were kept and forwarded to the State authorities at Boston.

At Reading it was reported that the industrial diseases which are required to be reported by State law are also sent to the health officer, who keeps records and makes investigations of such reported cases. A history of each case is taken and includes the occupational data. Recommendations are made to the plant officials to correct industrial hazards where found.

At Kansas City, Kans., records are kept of cases of chemical poisonings and other diseases resulting from employment, but no investigation of these cases is made.

In 12 cities in this group some type of sanitary inspection and control is carried on. In the majority of these cities, however, this sanitary control is limited entirely to investigation of nuisances, inspection of water supplies, and sewage disposal.

Six cities report that the health officer has the authority to prevent industrial hazards. At Akron it was stated that authority existed but was not utilized. At Atlanta a local ordinance covers this authority. At Flint the health officer has authority under a State law.

Educational measures were carried on by 11 cities. In a majority of these cities these educational measures consisted in the placing of placards and posters in factories, but in a few instances lectures by the health officer or one of his assistants were given at the plants.

At Syracuse a survey of industrial conditions was made, the appropriation being paid from the Milbank fund. This investigation was very complete, and copies of this report may be obtained from the city health officer or the Milbank fund.

In the fourth group of cities, those having a population of from 70,000 to 100,000, two (Allentown and Lawrence) reported that industrial diseases are notifiable. At Allentown records of the diseases which are required to be reported under the State law are kept by the health officer, who investigates the cases and makes recommendation for the abatement of the hazards. At Lawrence it was stated that those diseases which cause compensable injury are reported to the health department. Anthrax is given as the only occupational disease which is reported. The record did not show whether or not any investigation of these cases was made by the city health department. At Sioux City, Iowa, where damage suits are involved, the health officer visits the plants.

Sanitary inspections and control were carried on by the city health departments of Allentown, San Diego, and Fort Wayne. At Allentown and San Diego, these inspections are principally for general sanitation, water supply, and sewage disposal. At Fort Wayne the character of inspection was not stated.

At Sioux City and Waterbury the health officer has authority to prevent industrial hazards. Only one city in this group, Sioux City, carried on any special educational measures.

SUGGESTIONS AS TO THE ACTIVITIES OF CITY HEALTH DEPARTMENTS
IN RELATION TO INDUSTRIAL HYGIENE AND SANITATION

In reviewing the survey records of this group of 100 largest cities in the United States, one is immediately struck by the fact that industrial hygiene is almost entirely a State function. Of somewhat greater importance is the fact that, except in a very few instances, the health officer has but few data of the number, character, or sanitation of the industries within his city, and very little information of the State work in his community. Possibly some of the main reasons for this lack of cooperation with the State and industry are, first, the fact that the division of industrial hygiene in the majority of States is not under the State health department but under the Department of Labor or Department of Labor and Industry; second, that industrial medical services have been privately developed by industries; and lastly, lack of local industrial laws giving the health officer the right of factory or sanitary inspection.

Factory inspection is a specialized character of investigation, dealing as it does with problems of ventilation, illumination, electricity, mechanics, etc. For this reason it is more properly and economically a function of the State for, except in the very largest cities, it is impossible to maintain inspectors sufficiently qualified to conduct the investigations required of them. It certainly can not be expected of the health department to maintain such a corps of inspectors. On the other hand, even in those cities where industrial diseases are notifiable and reported to the State industrial commission, in the majority of instances the health officer is not furnished with a record of the cases reported from his community. This unquestionably is a faulty plan, as much so as the reporting of mortality directly to the State without the health officer's having been furnished with a copy of the cause of death. It is believed, then, that closer cooperation with that branch of the State government in which there is a division of industrial hygiene and sanitation is desirable on two points; first, that the health officer should be kept informed of the notifiable industrial diseases reported from his community, and of the State's investigation of these diseases; and secondly, he should be furnished with some brief copy or summary of the factory inspections of the industries within his community. Occupational diseases may not be as numerous or as important as communicable diseases, but they form, without a doubt, a very important factor in the health of the adult population of the community.

The lack of sanitary control of factories in cities by the city itself is startling. In but 25 of the 100 cities was any attempt made

to supervise the general sanitation of industries, yet it is quite probable that a majority of the male population of any community spends the greater portion of its wakeful period at the place of occupation. It is true that the sanitary condition of industries will be cared for, to a large extent, by the State, and will be regulated under State laws, especially those providing for the number and type of toilets and urinals for the working force. It is not desired that this State work should be duplicated, but it seems certain that the health officer is responsible for the sanitation of his industries, as much so as he is for the sanitation of private homes and tenement houses.

That part of sanitary inspection service which relates to water supplies and sewage disposal should be a function of the health department. It is especially desirable that the health officer should have an intimate knowledge of industrial water supplies within his city, and should make certain that if these supplies come from polluted sources there is no possibility of contamination by means of by-passing the water into the clean drinking supply.

The health officer is not directly concerned with the medical service of industries which are provided for the employees, but it would seem desirable, however, that he should have an intimate acquaintance with the character of industrial medical services which are furnished, and with the clinic and dispensary facilities operated by these plants. Indirectly he is concerned with factory health. Medical services in industry are an important factor in keeping the health of any community at a high level, and the health officer is becoming more and more interested in every phase of community life which reacts on the health of his city. Large plants can economically provide their own medical service. Small plants are unable to do so, and while the health officer is not expected to provide such a medical service, he may well aid in furthering some cooperative plan between small industries which will supply this need.

The question of occupational clinics is a difficult one to discuss from the standpoint of health department activities. In only one city, New York, were the occupational clinics conducted by the health department. It might well be argued that the health department is obliged to maintain an occupational clinic in the same manner that it maintains school clinics. There is certainly a valid reason why large industrial cities should encourage the establishment of such a clinic in cooperation with private hospitals. Occupational clinics such as have been conducted by the Massachusetts General Hospital at Boston are of the greatest value to the industrial population of that city, and in the teaching of the medical profession. There is no question as to the need of occupational clinics. The question of

whether or not they should be supported from health department funds is debatable, but it would seem that city support might be given such a clinic until it could support itself or be operated by hospitals or by private physicians.

There is one character of work which is performed by the city health department in many cities that certainly could be extended to all, and that is the use of school physical examinations in the making out of working papers. In this country and in England when working papers are required it is usual to make only a superficial examination of the child to determine whether or not working papers may be granted, rather than to use the excellent school physical examination history, which contains usually a survey of the child's health for at least six years. The use of these school physical examinations for the granting of working papers can not be too strongly urged, whether or not these papers are granted by the board of education or by the department of health.

XII. MUNICIPAL PUBLIC-HEALTH NURSING

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As a municipal function, public-health nursing is a relatively new activity, the city of Los Angeles having been the first to engage the services of public-health nurses in 1898. In 1900 there were only about 130 visiting nurses on record. In 1924 there were probably 12,000 public-health nurses in the United States on duty in State, municipal, and private work, approximately one half of them rendering service in the 100 largest cities.

In the development of the modern public-health movement, public-health nursing has firmly established itself as an essential community responsibility and it has become one of the most important activities in the services rendered by municipal health departments. In addition to providing nursing care for the unhospitalized sick, the theory and practice of public-health nursing has been extended into many of the fields of public-health enterprise so that to-day the public-health nurse is a necessary factor in health promotion activities and in preventive health work.

In the general health survey of the 100 largest cities, undertaken in 1924, it was realized that it would be necessary to take into consideration the nursing services provided by private agencies as well as those rendered by municipal authorities in order to present a fairly adequate conception of the extent to which public-health nursing had been developed. Private agencies in many cities continue to provide many kinds of nursing service that have become rather generally accepted as legitimate responsibilities of municipal authorities. Owing to the great variety of organization and to the lack of uniformity in methods and records it was found to be impracticable to attempt to secure a complete record of the services rendered by all of these private agencies.

In order to set apart the public-health nursing activities of the official health agencies in the large cities under consideration, the following discussion presents an analysis of the information and data collected for 1923. In spite of unavoidable inaccuracies and incompleteness of data included in the summaries presented, they will serve as a basis of fairly definite conclusions in respect to the present status of public-health nursing and will emphasize the need of its further development.

1. PUBLIC HEALTH NURSING IN MUNICIPAL HEALTH DEPARTMENTS

Whatever may be the future of public-health nursing as a function of municipal health administration, present practice and the experience of different cities indicate a rather unsettled state of affairs. Many of the basic principles involved in the theory and practice of this important activity have been fairly definitely established though by no means universally accepted. The character and amount of service rendered in different cities varies widely and comparative analyses of quantitative or qualitative facts are difficult and at times misleading.

In the following analysis the number of public-health nurses reported as on duty under municipal direction represents the data furnished by the responsible authorities in each city surveyed. Nurses engaged in hospital or other institutions are not included, the figures given representing only those serving in the capacity of public-health nurses. There are included also nurses reported on duty in certain health department clinics and others engaged in rather perfunctory service not primarily of the nature of field nursing. As far as the data permitted, the present discussion includes all nursing service provided under municipal supervision with the exception of those nurses assigned to purely hospital duties.

While the accuracy of the figures used can not be guaranteed, the data originally reported in the schedules were subsequently checked and verified by correspondence. Consequently the facts presented below represent a fairly complete record for 1923. It was surprisingly difficult at times to secure reliable personnel statistics. In a fairly large group of cities, however, minor inaccuracies probably will not affect group averages or prevent fairly reliable conclusions.

ORGANIZATION AND ADMINISTRATION

In the 100 large cities surveyed for 1923, 85 cities reported the employment of public-health nurses. Three other cities reported one or two nurses on duty only in venereal-disease clinics. There were 85 cities, therefore, which provided some field nursing as a part of municipal health activities.

Separate nursing bureaus.—In 24 of these 85 cities public-health nursing was recorded as organized as a separate bureau or division of nursing. Definite details of organization or administration were often lacking, so that generous allowances were made in classifying cities in this respect. The following cities made some claim to the establishment of separate nursing divisions: Group I. Baltimore, Chicago, Detroit, Los Angeles, San Francisco. Group II. Cincinnati, Milwaukee, Rochester, Toledo. Group III. Akron, Atlanta, Dallas, Fall River, Flint, Jacksonville, Lynn, Nashville, New Haven,

Richmond, Salt Lake City, San Antonio. Group IV. Allentown (only one whole-time and one part-time nurse), Lawrence, Savannah.

The circumstances as regards the plan of organization of nursing activities differ considerably. In some cities there appears to be a distinct divisional organization of the nursing service. In other cities this service is reported as a separate division in some other bureau of the health department. In Baltimore, included above in the group reported as having separate nursing divisions, some of the nurses were rather definitely assigned to the division of child welfare. In Chicago the nursing service is organized as a division in the bureau of child welfare and nurses are on duty in other activities.

In Toledo the public-health nurses were organized as a division of communicable diseases constituting the only personnel engaged in that work with the exception of a part-time epidemiologist. The division is in charge of a supervisor of nurses and communicable disease control represented the only public health nursing activity undertaken by the health department, the school health supervision program being a function of the school authorities.

In Richmond the health-department nurses were organized as a division of child welfare. The chief nurse was in charge of this division, devoting about half of her time to child welfare, the balance to other activities. Of the staff of 14 nurses, 3 were devoting whole time to tuberculosis, with 9 others giving part of their time to this work. Two nurses were assigned entirely to venereal-disease duty and eight divided their time on prenatal and infant welfare.

In Lawrence a somewhat similar organization was reported. In this city the health-department nurses, under a nurse supervisor, formed the division of child welfare, responsible for infant and school health work, with nurses assigned also to communicable disease, tuberculosis, and venereal disease activities.

New Haven reported a separate bureau of public-health nursing, and in addition eight nurses were on duty in the bureau of communicable diseases. In Dallas, also included in this group, five nurses were organized under a chief nurse and one other on duty in a clinic established for the medical examination of food handlers. In some of the other cities included in this group the organization of nursing services as separate or distinct divisions is not as clearly defined although they have been so included for the purposes of the present analysis. Public-health nursing in St. Louis was carried on by the hospital department and no nurses were on duty in the health department. For this reason this city has not been included in the present group.

Administrative supervision.—In 81 cities for which the information was given, public-health nurses were placed under the direction

of a supervising nurse in 33 cities and under the medical officer in charge of departmental bureaus or divisions in 21 cities. In 22 cities the health officer or assistant health officer assumed the direction of nursing activities, and in 1 city (Evansville) the nurses worked under the direction of a chief sanitary officer who has general charge of all activities under a part-time health officer who acts as secretary of the board of health and charities. In four of these cities no provision was made for nursing supervision. In a few cities this responsibility was divided, part of the nurses serving under a nurse supervisor, others under the direction of various other division officials. In a few cities (reported in Erie and Wilmington) the health-department nurses worked under the direction of the chief nurse of the visiting nurse association.

Supervision of nurses in 81 cities

	Under direction of—				
	Nurse	Chief of division	Health officer or assistant	Chief sanitary officer	None
Group I.....	8	3	-----	-----	-----
Group II.....	6	5	3	-----	-----
Group III.....	15	7	13	-----	4
Group IV.....	4	6	6	1	-----
81 cities.....	33	21	22	1	4

With a growing demand for public-health nurses in municipal health departments, and a real scarcity of nurses adequately trained for this field of work, health officers are confronted with the problem of teaching, training, and supervising the work of department nurses. In those cities, comparatively few in number, in which public-health nursing has been developed as a distinct divisional organization in the health department, central supervision under a competent executive and administrative nurse director is usually recognized as a necessity.

In the larger cities, with fairly adequate nursing staffs and diversified nursing activities, district supervisors of nurses and specialist supervisors have been found to be necessary. There appear to have been very few strictly educational supervisors who devoted their time and energies to the training of newly recruited nurses. The problem of training newly appointed personnel in the nursing unit is in reality a very serious one whether the new nurse is assigned to a generalized service or to some special activity.

In the smaller cities, and in the larger ones employing a few nurses, the problem of administrative supervision has not, as a rule, been satisfactorily solved. In some instances the more experienced nurses are given general supervision over other nurses working in

districts or in specialty groups and, as field supervisors, frequently attempt to combine the duties of supervision over other nurses with their own field activities.

The average number of nurses per supervisor in the health department of 85 cities in 1923 (12.47) indicates practically no increased provision for nursing supervision when compared to the average reported for municipal nursing in 1920 (12.4). This average in 1923 varied from 11.1 in Group I to 25 in Group IV.

In cities where health department nurses are more or less decentralized or assigned to special duty in various functional activities, some attempt has been made to exercise general-control supervision. Cities with only a few nurses on duty frequently provide no direct supervision, the nursing staff in these cities usually serving directly under medical chiefs of divisions or clinics; otherwise there is very little directional supervision.

Medical supervision.—The importance of the nurse director and supervisor has been generally recognized. On the other hand, the tendency to place the nursing staff under the direction of medical personnel is shown by the fact that 74 cities in the group now being studied reported some degree of medical supervision: In Group I, 11 cities; Group II, 9 cities; Group III, 37 cities; Group IV, 17 cities.

In some cities part of the nursing staff were directly responsible to medical officers of the health department, while the others were either serving under supervising nurses or working independently. Nurses engaged in communicable-disease activities and in school health work frequently served under the direction of the medical chief of these divisions. In some of the clinics there was also medical supervision, while in other activities, such as infant welfare, medical supervision was not always provided.

In smaller cities and in cities with small nursing staffs the nurses were frequently responsible directly to the health officer or whoever exercised the chief executive function in the department.

The problem of supervision and direction of the activities of public-health nurses still confronts the majority of municipal health officers and more serious attempts should be made to study the entire problem.

Administrative details of nursing supervision in municipal health departments are sadly lacking, and there are many features associated with the problem that should be more thoroughly studied: The ratio of staff nurses to supervisors, centralization and decentralization of nursing resources, the relative advantages of the so-called generalized and specialized plans, effective methods of training newly appointed nurses, certain standards of service, and, particularly, a fuller knowledge of what should constitute an economic distribution of a nurse's working day, the number of home visits, and patients served per clinic hour. These and other equally impor-

tant problems still require a more critical study, with careful interpretation of all the facts concerned.

Conditions of appointment.—Practically all of the cities (85) in which public-health nurses were engaged in health-department activities reported that only graduate nurses were appointed to positions in the department. In 36 cities appointments were placed under civil-service rules and regulations. In 31 cities civil-service requirements were not applied, and for the other cities no information was given for this item of inquiry. In some cities, directors and supervisors are exempt from civil-service regulations.

Only a few cities specify any experience or previous training in the qualifications prescribed for public-health nurses. Rochester and Detroit specified a requirement of one year's experience. The report for San Francisco indicates that only registered nurses having public-health degrees are appointed, under civil service, with a requirement of two years' previous experience. Appointments are made for a probationary period of two or three months in a few cities, apparently on account of civil-service provisions. In Detroit it was reported that the standards proposed by the National Organization for Public Health Nursing were applied.

Appointments are frequently made by the health officer or by the mayor or council upon his recommendation. Choice of applicants is left to the supervising or chief nurse in some cities and exercised by division chiefs in a few instances.

NUMBER OF PUBLIC HEALTH NURSES EMPLOYED IN MUNICIPAL HEALTH DEPARTMENTS

Of the group of 100 large cities, 15 cities¹ reported that no public-health nurses were employed in the health department in 1923 for field duty, including Tacoma and Wilmington, each having one part-time nurse assigned to a venereal disease clinic, and Fort Wayne with one full-time nurse on similar duty. Fourteen cities, therefore, reported no full-time health department nursing service (exclusive of nurses on duty in various hospitals).

Three other cities included in the present analysis reported that the only nurses engaged in health department activities were those serving in venereal disease clinics, all on full-time status (South Bend one nurse, Knoxville and Spokane two nurses each). There were, apparently then, 18 cities in 1923 in which there were no definite provisions for the employment of public-health nurses in field activities under the direct control of the health department.²

¹ See list of cities appearing in note in Table I reporting no health department public-health nurses in 1923.

² Knoxville, South Bend, and Spokane are included in the list of 85 cities used in the present analysis.

For the cities having one or more health department nurses on duty in 1923, either full or part time (exclusive of hospital nurses), the following list indicates the frequency distribution of these cities as to the number employed (including directors, supervisors, and staff nurses).

Number of health-department nurses, 1923, exclusive of hospital nurses

	Number of cities
None.....	12
1 part-time venereal-disease clinic nurse only.....	2
1 whole-time venereal-disease clinic nurse only.....	2
2 whole-time venereal-disease clinic nurses only.....	2
1 nurse.....	6
2 nurses.....	3
3 to 5 nurses.....	13
6 to 10 nurses.....	12
11 to 15 nurses.....	10
16 to 20 nurses.....	17
21 to 30 nurses.....	6
31 to 40 nurses.....	4
41 to 50 nurses.....	2
51 to 60 nurses.....	2
61 to 70 nurses.....	1
Over 70 nurses.....	6
Total.....	100

Directors and supervising nurses.—From the records available the number of nurses who served in the capacities of directors or supervisors can not always be definitely determined. The distinction between directors or nurses who occupy executive or administrative positions, and supervisors, whose chief duties are the education and instruction of staff nurses, is frequently indefinite.

Table I gives the total number of supervisors and staff nurses reported in the 85 cities having one or more public-health nurses on duty in the health department. The information reported under this item probably does not give a fair record of the character and degree of supervision actually exercised in this group of cities. The effective division of function and responsibility of the nursing personnel designated as directors or supervisors is not always clearly defined. Some of those recorded as supervisors undoubtedly rendered some direct nursing services and, on the other hand, nurses included in staff personnel probably served at times in the capacity of supervisors.

The average number of staff nurses for each supervisor in the 85 cities in 1923 was 12.47, which is practically identical with the ratio given for the cities surveyed in 1920 (12.4).

This ratio varies considerably as between different cities as well as between the usual population groups as shown by Table I. Cities

in Group I, of over 500,000 population, give an average closely approaching a fairly desirable ratio, although there are variations from approximately 5 to 25 nurses per supervisor. Group III shows a slightly higher average, while Groups II and IV are considerably higher. All groups show about the same variations in individual ratios. Group IV cities, generally, reported very little nursing supervision. From the records obtained for 1923 only 35 cities out of 85 appeared to have provided fairly adequately for nursing supervision.

TABLE I.—Public-health nurses on duty in municipal health departments (exclusive of hospital nurses), by population groups, showing ratio of staff nurses to supervisors, 85 cities, 1923

Population groups	Total population	Number of super- visors	Number of staff nurses	Total number of public health nurses ¹	Average number of staff nurses for each supervisor	Average number of nurses per 100,000 population ²	Variations in number of nurses per 100,000 population	
							Highest ratio	Lowest ratio
Group I, 11 cities...	16, 436, 315	118	1, 307	1, 425	11. 1	8. 3	{Detroit----- 19. 8 {Baltimore----- 16. 9	Philadelphia----- 4. 8 Boston----- 4. 0
Group II, 14 cities...	4, 976, 237	17	316	333	18. 6	6. 7	{Rochester----- 17. 7 {Indianapolis-- 14. 6	Denver----- 1. 8 Portland----- 1. 8
Group III, 43 cities...	6, 387, 423	36	459	495	12. 8	7. 7	{Bridgeport--- 18. 2 {Erie----- 17. 9	Oklahoma City--- 1. 0 Kansas City,Kans. . 9
Group IV, 17 cities...	1, 508, 439	4	100	104	25. 0	6. 5	{Lawrence----- 19. 6 {Manchester-- 16. 0	Harrisburg----- 1. 2 Bayonne----- 1. 2
85 cities.....	29, 308, 414	175	2, 182	2, 357	12. 47	8. 0	Detroit----- 19. 8	Kansas City,Kans. . 9

¹ The following 15 cities reported no public-health nurses on duty in the health department in 1923: Group I, St. Louis; Group II, Columbus, Kansas City, Mo.; Group III, Fort Worth, Hartford, Houston, Tacoma (1 part-time nurse in venereal disease clinic), Tulsa, Wilmington (1 part-time nurse in venereal disease clinic), Youngstown; Group IV, Fort Wayne (1 nurse in venereal disease clinic), St. Joseph, Sioux City, Wichita, Wilkes-Barre.

² Average based upon all nurses employed.

Table I includes the total number of public-health nurses on duty in the health departments of the 85 cities used in the present analysis. The larger cities, as a general rule, provided more nursing service than did the average city in the smaller groups. The average number of nurses per 100,000 population for the 85 cities was 8, with decided variations from nearly 20 nurses in Detroit to practically 1 nurse in several cities.

On the basis of the provisions made by municipal health authorities for utilizing the invaluable service of the public-health nurse, no city included in the group under consideration approached anywhere near the service usually recommended as representing reasonably adequate public-health nursing facilities. In several of the 85 cities included in the present discussion the total available resources are fortunately augmented by services rendered by other municipal and nonofficial agencies.

Although public-health nursing has been rather universally accepted as a proper and necessary function of municipal health

authorities, it would appear from the data available, that even those cities standing near the top of the list are still short of the usually accepted standard of 1 nurse for each 2,000 population.

Clerical assistance.—In the 24 cities listed as having separate bureaus of public-health nursing, clerical assistance was provided on an average ratio of 1 clerk to each 18.8 nurses. Provisions for definite clerical assistance varied rather widely according to the reported information, from 1 clerk to each 8 nurses in Toledo to approximately 1 clerk for 65 nurses in Baltimore. Ten of these cities recorded no clerical help as definitely assigned to the nursing divisions.

In those cities in which the nursing service was not separately organized, some clerical assistance was apparently given to the nursing activities, although usually the schedules did not specifically make this distinction.

Reasonably adequate clerical and office facilities are unquestionably needed in order to relieve the nursing personnel of certain routine office work, although there appears to be very little basis for decision as to what constitutes an adequate clerical staff.

EXPENDITURES

Many difficulties were encountered in an attempt to segregate health department expenditures for public-health nursing. There is but little uniformity in the accounting systems in use in the present group of cities. In order to compare and analyze the expenditures for nursing, it has been necessary to utilize such items as are set apart in annual appropriations, classified items in budgets or, for a few cities, itemized lists of actual expenditures. Facts or figures given by the health department frequently do not check with the records of the city accounting or finance departments.

For public-health nursing, the actual cost of the service is frequently included in the expenditures charged to other principal activities such as communicable disease control, infant welfare, or school medical supervision. Salary costs for this service can usually be calculated from the data given in the schedules. Maintenance and other expenses incidental and properly creditable to the nursing service can not always be determined and special correspondence subsequent to the survey often failed to obtain reliable data for expenditures other than salaries.

In the summary presented in Table II every item entered was carefully scrutinized in order to set forth the cost of nursing services in as large a number of cities as was possible. Data for 79 cities were finally accepted as being reasonably reliable and the averages shown for the several groups of cities can be accepted as fairly accurate for the year 1923.

In Table II total salaries include the salaries of all public-health nurses credited to the health department and in addition the salaries of clerical and other nonnursing personnel specifically charged against the nursing service. In a number of cities, especially those in which there was no separate divisional organization, clerical and other assistance was undoubtedly supplied by the bureau or division to which nurses were assigned. Transportation, nursing supplies and other maintenance charges were not always sufficiently itemized to permit proper distribution of these items.

Salary expenditures for the 79 cities included in this table are believed to be sufficiently complete and reliable. The figures representing the total expenditures for public-health nursing, for the reason just set forth, without doubt are minimum figures for this activity.

To ascertain the approximate cost of the nursing service provided in the 79 cities for which it was possible to compute or select this information, the total health department expenditures shown in the table are exclusive of hospital maintenance and the cost of the collection and disposal of garbage and refuse in such cities as these items appeared in the health department budget or allotment.

TABLE II.—*Health department expenditures for public-health nursing; averages for population groups; per cent of total budget; per capita cost; average cost per nurse employed, 79 cities, 1923*

Population group	Total population	Total number of nurses	Expenditures for public-health nursing			(A) Total expenditures health department exclusive of hospitals and garbage	Per cent of total (A) expended for public-health nursing	Per capita cost of nursing service	Average cost per nurse employed	Average number of nurses per 100,000 population
			Total salaries	Other expenditures	Total expenditures for nursing service					
Group 1, 10 cities ¹	10, 608, 710	883	\$1, 213, 135	\$120, 884	\$1, 334, 020	\$6, 382, 723	{ 20. 9 (19. 0)	<i>Cents</i> 12. 6 (11. 4)	\$1, 510 (1, 374)	8. 3
Group II, 12 cities ²	4, 178, 698	315	458, 563	15, 459	474, 023	2, 135, 477	{ 22. 2 (21. 5)	11. 3 (10. 9)	1, 505 (1, 456)	
Group III, 40 cities ³	6, 002, 389	475	661, 573	62, 539	724, 113	3, 085, 470	{ 23. 5 (21. 4)	12. 1 (11. 0)	1, 524 (1, 393)	7. 9
Group IV, 17 cities ⁴	1, 525, 253	105	141, 350	16, 501	157, 851	655, 319	{ 24. 1 (21. 6)	10. 3 (9. 3)	1, 503 (1, 346)	
Total, 79 cities	22, 315, 050	1, 778	2, 474, 621	215, 383	2, 690, 007	12, 258, 989	{ 21. 9 (20. 1)	12. 1 (11. 1)	1, 513 (1, 391)	7. 9
23 cities ⁵ with separate nursing divisions	6, 575, 511	778	1, 130, 853	80, 555	1, 211, 408	4, 177, 631	{ 29. 0 (27. 1)	18. 4 (17. 2)	1, 537 (1, 435)	

¹ Group I. Baltimore, Boston, Buffalo, Chicago, Cleveland, Detroit, Los Angeles, Philadelphia, Pittsburgh, San Francisco.

² Group II. Cincinnati, Columbus (city paid visiting nurse association for nursing services), Denver, Indianapolis, Louisville, Milwaukee, Minneapolis, Newark, New Orleans, Rochester, Seattle, Toledo.

³ Group III. Akron, Albany, Atlanta, Birmingham, Bridgeport, Cambridge, Camden, Dallas, Dayton, Des Moines, Duluth, Elizabeth, Erie, Fall River, Flint, Grand Rapids, Jacksonville, Kansas City, (Kans.), Lowell, Lynn, Memphis, Nashville, New Bedford, Norfolk, Oakland, Omaha, Paterson, Providence, Richmond, St. Paul, Salt Lake City, San Antonio, Scranton, Spokane, Springfield, Syracuse, Trenton, Utica, Worcester, Yonkers.

⁴ Group IV. Allentown, Bayonne, Canton, El Paso, Evansville, Fort Wayne, Harrisburg, Knoxville, Lawrence, Manchester, Peoria, San Diego, Savannah, Schenectady, Somerville, Troy, Waterbury.

⁵ For list of 24 cities listed as having separate nursing divisions, see page 349. Chicago is omitted from above table as it was possible to obtain only an estimate as to expenditures. These cities are also included in the 79 cities summarized in the 4 population groups above.

⁶ The figures in parentheses are based upon salary expenditures only.

The percentage distribution of health department expenditures for public-health nursing in 79 cities is shown in Table II. Based upon total costs charged to the nursing services in these cities, the average percentage of the total health department expenditure chargeable to public-health nursing in 1923 was 20.9 for six cities in Group I. It was slightly higher in each of the succeeding groups, but this percentage distribution was fairly uniform for the four groups. As shown by figures in parentheses the percentages based upon salaries alone are slightly lower. The average for the 79 cities was 21.9 per cent. There were wide variations in individual cities—Kansas City, Kans., 6 (1 nurse); Denver, 7.7; Boston, 7.6; Detroit, 38.5; Akron, 47.4; Lawrence, 54.7. Forty-one cities spent over 20 per cent of the health department allotment and 18 cities over 30 per cent.

For the group of cities reporting a separate nursing division, the average cost of this service is shown for 23 cities. Although there were fairly wide variations in this group, the average of 29 per cent is decidedly higher than the average for the entire group of 79 cities. In this group of 23 cities 16 cities expended over 20 per cent of the total health department allotment for public-health nursing and 8 cities exceeded 30 per cent. This percentage varied from 9 for San Antonio and 11.2 for Flint to 47.4 for Akron and 54.6 for Lawrence.

The average per capita cost for public-health nursing for the 79 cities included in Table II was 12.1 cents, varying from 10.3 in Group IV to 12.6 in the 6 large cities in Group I. The per capita cost of nursing varied as follows: Bayonne, 1.7; Kansas City, Kans., 1.8; Peoria, 1.9; Boston, 5; Cincinnati, 6; Rochester, 24; Akron, 28.1; Detroit, 32.1; Lawrence, 35.7.

In the 23 cities reported as having separate nursing bureaus the average per capita cost of the nursing service was 18.4 cents, with variations from 3.2 cents in San Antonio to 35.7 cents in Lawrence. Seventeen cities spent less than 5 cents per capita, 21 cities from 5 to 10 cents, 26 cities from 10 to 20 cents, 13 cities from 20 to 30 cents, 2 cities over 30 cents.

The average cost per public-health nurse employed is shown in the last column in Table II. For all expenditures charged to the nursing services in the 79 cities, the average cost per nurse was \$1,513. In the 23 cities with separate nursing divisions this average cost per nurse was a little higher, \$1,537. For the entire group of 79 cities, this figure varied as follows: Flint, \$956; Lowell, \$1,076; Boston, \$1,214; Springfield, \$1,958; Kansas City, Kans., \$2,008; Pittsburgh, \$2,241.

It is not possible to compare the expenditure items given in Table II with the data presented in the report covering the surveys of 83.

cities in 1920.³ In this report for 1920, Table IV, page 49, gives the percentage distribution of expenditures (72 cities) for public-health nursing as 3.4 per cent of the total expenditure charged to the health departments in the 72 cities. When this percentage is compared with the average given in the present table for 79 cities (21.9) it is obvious that in the earlier report computations were made upon an entirely different basis. In Table VII, page 51, of the report for 1920, the average per capita cost of public-health nursing in 7 cities having a specific budgetary allotment for nursing was 10.6 cents as compared with 12.1 cents for 1923. The low percentage distribution for nursing in 1920 is probably only a part of the actual cost of nursing, the major portion of this cost being included in other items and not readily segregated in order to show the total cost of public-health nursing. The increase from approximately 10 cents in 1920 to 12 cents per capita in 1923 probably represents a real increase in the allotments made for this service.

CHARACTER AND SCOPE OF PUBLIC-HEALTH NURSING SERVICE PROVIDED
BY MUNICIPAL HEALTH DEPARTMENTS

The rôle of the public-health nurse in municipal health-department activities is more varied and on the whole less organized and defined than that of any other personnel. In a large group of cities these nurses will be found engaged in every conceivable activity. They have been placed in direct charge of such organized divisions as child welfare and tuberculosis. In the group of cities now under discussion a few nurses were engaged in administrative duties in the central office, others in the special field of publicity and education, and a few assigned to work in connection with the division of vital statistics.

In the control of communicable diseases many cities have assigned public-health nurses for various duties, such as checking the morbidity reports; investigative follow up of cases reported; verification of diagnosis in certain diseases; search for contacts, carriers, and sources of infection; epidemiologic studies; the taking of cultures and the collection of specimens for laboratory analysis. The posting of placards is frequently a function of the nurse, and she is likewise charged with the maintenance of quarantine and supervision over the practice of concurrent and terminal disinfections. She occasionally takes cultures for release and performs vaccination. In a few cities the nurse will be found on duty in the laboratory, and in at least one city she assists in the examination of food handlers. She is finding her way in the newer fields of industrial and mental hygiene and plays an important rôle in special health weeks, health

³ Public Health Bulletin No. 136, pp. 32-51.

exhibits and demonstrations, and in the management of the modern health crusades.

The versatility of the health-department nurse has been established and she has been recognized as one of the most valuable members of the staff. In the attempt to carry to the home the essential principles of personal and public hygiene, the public-health nurse has become the most effective field agent in the department. As a specialty in the public-health field, public-health nursing is a comparatively recent development and for this reason, perhaps more than any other, this service has been less well organized or standardized.

The public-health nurse is gradually emerging from a rather chaotic existence and in the administration of the modern health department her chief functions have become more clearly defined. In practice she has rendered meritorious service in such organized activities as communicable-disease control; antituberculosis work; venereal disease clinics and follow-up; prenatal, infant, pre-school, and school hygiene. In these activities her services are almost, if not quite, indispensable. In the attempt to control disease it is the nurse who gains access to the home and the sick room and brings with her the gospel of health. With even better success she helps the expectant mother, provides obstetrical care, and then follows the newborn infant and mother through the critical stages that follow birth. She supervises the activities of midwives and prevents or alleviates the unfortunate results of ophthalmia neonatorum. She inspects and regulates the practices in infant boarding houses, follows up illegitimate births, and renders service in milk depots and clinics for maternal and child guidance.

In school-health supervision the public-health nurse carries on certain routine or emergency examinations and assists school physicians in periodic medical inspections. It is the nurse who usually advises parents concerning correctable defects in their children of school age and encourages them to secure the needed medical or surgical attention. It is the school nurse who follows up absenteeism due to sickness or disease. It is the nurse who is largely responsible for many other of the activities that form a part of the school-health program, such as the instruction of teachers in health matters, health talks, and other educational work, special classes for special groups, health drills, first-aid, and other activities intended to promote better health in the school child.

There continues to be some difference of opinion concerning the proper place of the public health nurse in health department work. The kind of service she can most effectively render is also an unsettled problem in actual practice. Some cities provide bedside nursing

for the unhospitalized sick and, through the nurses, furnish relief to the indigent and others needing their services. The present discussion does not take into consideration municipal nurses assigned to strictly hospital duty as distinguished from field services, which constitute the primary objective of the public health nurse. These field nurses serve in the various municipal clinics and dispensaries and perform other duties already indicated.

In the attempt to analyze the public-health nursing service provided in the 100 cities included in the present survey, the foregoing remarks will serve to indicate the great variety of procedure that has developed in respect to this particular activity. While the experiences of these cities may justify rather definite conclusions as to the position and requirements of public-health nursing in the municipal health-department program, a review of the nursing services now provided does not appear to support any definite or clear-cut program that approaches any uniform or acceptable standard. The following discussion therefore will undertake primarily to set forth the conditions and circumstances revealed by the survey made in 1924.

GENERALIZED VERSUS SPECIALIZED NURSING

Without undertaking forthwith to review the relative merits of the so-called generalized-nursing plan as opposed to a specialized service, the kind of service reported for the cities surveyed as of 1923 will be presented. For the purpose of the present discussion, a generalized-nursing service is one in which all of the nursing activities undertaken by the department are combined in the service rendered by each nurse in her regularly assigned district. A specialized service, on the other hand, attempts to provide nurses primarily trained to carry on a special activity such as tuberculosis or infant welfare work, or at times a combination of two or more specialties. In actual practice, the line of demarcation between these two kinds of service is not always clearly defined. In the survey for 1923, a nursing service reported as "generalized" might prove to include, in part at least, one or more specialized services or a combination of both.

In the 85 cities reporting one or more public-health nurses on duty in 1923, the nursing service was recorded as generalized in 12 cities, specialized in 56, and a combination of both in 17 cities.

In some of the cities recorded as providing a generalized service a part of the nursing service appeared to be more or less distinctly specialized, in some instances the majority of the nurses working under a generalized plan with special details for particular activities.

In Detroit and Minneapolis a generalized nursing service was in operation in one city ward or district. In Minneapolis this was reported as an experiment. In Detroit one district (Delray) was organized under the generalized plan. In a recent issue of the *Detroit Weekly Health Review* (week ending January 23, 1926) the commissioner of health of that city stated that it would be impossible to place the entire city under a generalized district-nursing plan unless untrained nurses were employed. According to this authority it ordinarily requires approximately 18 months to train a nurse properly for generalized service. With the present and usual turnover in personnel it appears impracticable for many cities to undertake to establish this type of service.

On the basis of services rendered in the Delray district in Detroit it would appear that generalized nurses rendered greater service than the average specialized nurse. There was an average of 2.1 services per call or visit reported in the Delray district, as against 1.57 for the remainder of the city. No evidence was forthcoming to indicate that the generalized service was more productive of results than were the other specialized services.

In over one-half of the cities now being considered (67 per cent), nearly all health department nurses were engaged on specialized services in 1923. A few cities (Memphis) have since reported a change from specialized to generalized nursing. In those cities reporting both kinds of service, a part of the nurses were assigned to generalized duty while others were engaged in tuberculosis, infant, school, or other specialties.

There appears to have been a slight tendency to adopt the so-called generalized district plan. Arguments in favor of this plan have usually pointed to the greater possibilities of economy in the assignment of nurses and reference is frequently made to the apparently unavoidable duplication of work that characterizes the specialized nursing service. The probability of five different specialty nurses visiting and advising the same family is undoubtedly overrated, and in practice there is less duplication than might theoretically occur.

Under the generalized plan it seems logical to insist upon providing specialized supervisors for the more essential activities in order that the generalized nurse may receive the advice and encouragement which these supervisors are able to supply. In the smaller nursing groups such a provision often becomes difficult, and it is here that the training of generalized nurses constitutes a real problem. In some of the cities in the present group specially trained

supervisors have been assigned to such activities as school nursing, infant welfare, and occasionally to other services. There is evidently a scarcity of adequately trained supervisors for the various specialized services. Personnel sometimes classified as supervisors were evidently merely rated as "head" nurses and given the responsibility of directing and supervising the work of a special group.

A quantitative survey, such as the present one, offers no basis for an opinion as to the relative advantages of these two general types of public-health nursing administration. Much more information is needed to illuminate this very important problem, such as the experience recently offered by the East Harlem nursing demonstration in New York.

It seems doubtful that any standardized administrative program can be adapted to all communities until the true purpose of public-health nursing has become more clearly defined and accepted by the general public. On the other hand, there is by no means an unanimous agreement among practicing health officers as regards the proper functions and duties of this nurse. A more or less popular demand for visiting service has been created by the activities of various private nursing and social agencies and health officers soon recognized that the trend of the public-health movement required greater efforts toward attempting to promote better community health by teaching the individual and the family group the more essential principles and rules of healthy living in order to prevent or avoid sickness or disease. No other agent in his department possessed the qualifications required for such an educational campaign as did the public-health nurse. She has come to stay but her technique has yet to be fully developed and economically applied.

KINDS OF NURSING SERVICE PROVIDED BY HEALTH DEPARTMENT

The present survey furnished no data for a qualitative estimate of the value of the services rendered by public-health nurses. Information of this character can only be obtained by a very comprehensive research with painstaking analysis and interpretation of all the details associated with the activities of this service. Nor is it easy to present even a quantitative review of the actual services rendered. Bookkeeping, records, and cost-accounting methods vary so markedly in different cities that it is practically impossible to compare the work performed in any selected group of cities.

As a measure of the relative importance of the several nursing services provided in the present group of cities, as shown by a

numerical distribution of nurses in certain specific services, Table III was prepared to show the distribution of nurses in the more important fields of activity in the 88 cities reporting one or more public-health nurses on duty in 1923.⁴ With the exception of the group classified as largely generalized, the percentage of all nurses assigned to specified duties are arranged in order of their relative frequency.

TABLE III.—*Kinds of nursing service provided by health departments in 88 cities, 1923—Relative importance of different services as shown by the percentage of nurses assigned to specified activities*

Nursing service provided in the following activities	Per cent of nurses so assigned	Number of cities providing specified service	Per cent of total cities (88)
School health supervision, public and parochial schools.....	27	32	36.3
Infant welfare (prenatal, infant, or preschool).....	21	44	50.0
Communicable disease control (general).....	10	6	6.8
Tuberculosis.....	9	37	42.0
Communicable disease control (other than tuberculosis and venereal diseases).....	7	46	52.3
Infant welfare and school health supervision.....	4	5	5.7
Venereal diseases.....	3	49	55.7
Generalized nursing (largely).....	19	22	25.0
	100	-----	-----

For comparison with the data given in Table III the health department for the city of Detroit reports the following distribution of nursing according to the administrative division in charge:

Percentage distribution of nurses in Detroit health department

Administrative division	Per cent of nurses engaged	Administrative division	Per cent of nurses engaged
School inspection.....	40.2	Delray district (generalized).....	8.0
Child welfare.....	17.8	Venereal diseases.....	4.7
Tuberculosis.....	13.6	Education.....	1.7
Communicable diseases.....	11.9	Special investigations.....	2.1

School nursing duties, not always clearly defined or exclusively confined to this work alone, occupied the time of approximately 27 per cent of all health department nursing personnel reported in the 88 cities. This service included work in either public or parochial schools, and as far as possible only those nurses were classified here as appeared to devote all or nearly all of their time to this activity.

To infant welfare activities, including prenatal, infant, and pre-school services, approximately 21 per cent of all nurses were as-

⁴ Fort Wayne, Tacoma, and Wilmington included.

signed. In addition about 4 per cent of these nurses were engaged in a combined service devoted to both infant and school work. Over half of the nurses in this group of cities, therefore, were assigned to child-welfare work, including prenatal services, infant and child hygiene up to and through the school ages. A relatively small percentage of these nurses were giving their time exclusively to maternal welfare. Obstetrical nursing service appeared to be woefully inadequate in probably a majority of the cities, even when the facilities provided by other agencies were considered. Very few cities had definitely organized any service primarily devoted to children of the so-called preschool ages, from two to six years, although infant welfare and school clinics provided service for some of the children of this group.

In the control of communicable diseases, 10 per cent of the nurses on duty in the 88 cities performed various functions. This item Table III includes, in some instances, tuberculosis and venereal diseases as a part of a general service. In addition, 7 per cent of the nurses were assigned to communicable-disease work, exclusive of tuberculosis and venereal diseases. Approximately 17 per cent of all nurses were thus engaged in this activity.

Nine per cent of the nurses on duty in the 88 cities were classified as specifically assigned to antituberculosis work and nearly 3 per cent to venereal disease clinics and follow-up. The remaining 19 per cent were listed as giving largely a generalized service without any specialty assignments.

Table III also indicates the number of health departments that provided each of the specified services. The frequency distribution in this column obviously does not agree in any respect with the relative proportion of nurses so assigned. Although 49 cities reported a venereal disease nursing service, a total of only 80 nurses were on duty in this specialty, largely in clinics, with one or two nurses per clinic, giving at times only part-time service. In 46 cities, or about 52 per cent of the 88 cities, a nursing service was provided for communicable-disease control, exclusive of tuberculosis and venereal diseases. Six other cities provided a somewhat similar service, although some attention was paid to the two special fields just mentioned.

Exactly one-half of the 88 cities had organized a nursing service in the various fields of infant-welfare activities. Over one-third of these cities had one or more nurses assigned to school health work, in 23 cities doing all of the public-school nursing, in the others being assigned to the parochial schools, or working jointly with the service provided by the educational authorities.

Although 37 cities reported some efforts in the official control of tuberculosis, only about 9 per cent of the nursing force was assigned to this work. This undoubtedly indicates that a majority of these cities has failed to provide anywhere near an adequate nursing service for this important public health problem. Some additional service was provided in 28 other cities, but no really serious attempts were apparently made in many of these to carry on a reasonably effective nursing service for those afflicted with this disease.

It should be remembered that the present discussion does not by any means represent all the nursing services available in this group of cities. Table III is confined entirely to the resources of the municipal health departments.

In addition to the nursing service provided by these departments, boards of education supplied nurses for school-health supervision and various voluntary agencies contributed nursing services in certain other activities such as tuberculosis, venereal disease, infant welfare, and in a few instances to other services.

A few cities included in the present survey continued the practice of including in their budget or annual expenditures an allotment that enables the health department to pay for certain nursing services furnished by private agencies. These data have not been included in Table III for the reason that accurate information was not ususally recorded as to the exact character or extent of these purchased services.

Certain specified duties performed by nurses.—In the schedule used in the present survey the attempt was made to ascertain the frequency with which health-department nurses performed certain specific duties. Although the replies to these items were vague and indefinite at times, they serve, in a measure, at least, to indicate the variety and frequency of certain duties performed by nurses.

Cultures for the purpose of laboratory examination were reported as taken by nurses in 62 cities, and in 15 cities they did not perform this function. This probably does not mean that all the diagnostic cultures were taken by nurses but that they did render this service at times.

Investigative visits to cases of reported communicable diseases were made by nurses in 66 cities. Fifteen cities reported that they did not carry on this function. Nurses conducted certain epidemiologic studies in 55 cities, while negative replies were received from 8 cities.

In 27 cities it was reported that department nurses either performed vaccinations against smallpox or assisted in this work. They

also assist in Schick testing and in the administration of toxin-anti-toxin in diphtheria-prevention campaigns. In 73 cities they served in the several clinics operated by the health departments.

NUMBER OF NURSING VISITS REPORTED IN 1923 BY HEALTH DEPARTMENT NURSES

Practically the only unit of measure that is usually reported as a quantitative expression of the amount of service rendered by the public-health nurse is the "visit." There is, unfortunately, no accepted standard or universally applied definition of just what constitutes a nursing visit, so that, even when the total number of visits is recorded, the service actually rendered in different cities can not be compared. Various services are counted as visits, such as nursing, instructive, home visits or follow-up, consulting, cases referred to other services or agencies, the visits of patients to clinics, the number of pupils examined or seen in school work, and various other services. The number of "services" rendered does not necessarily correspond to the number of "visits" reported. In Baltimore a large number of "cooperative" nursing visits are reported and it is difficult to interpret or compare these services with visits recorded in other cities.

In the present survey the number of nursing "visits" was obtained for 70 cities. These data for the other cities are either lacking or obviously misleading or incomplete. It is not possible, therefore, in the present discussion to offer any information in respect to the cost per visit, the quality of nursing technique, or the content of a nursing visit. The kind of service given in any specified field varies in different cities and apparently for different nurses in the same city. Very little information is available to indicate the average distribution of nurses' time.⁵

⁵ The Report of the Committee to Study Visiting Nursing, National Organization of Public Health Nursing, 1924, gives the following distribution of nurses' time for 14 nursing agencies:

<i>Percentage division of nursing day</i>		Per cent	Per cent
In office-----			19.1
Records-----	13.4		
Other clerical-----	5.8		
In field-----			77.2
Travel-----	25.1		
Home visits-----	43.4		
Other visits-----	0.6		
Clinics, classes, etc-----	8.0		
Miscellaneous-----			3.8

TABLE IV.—*Number of nursing visits per nurse and per 100,000 population, by groups and specified services, as reported by the health department in 70 cities, 1923*

	Number of cities	Number of nurses			Nursing visits classified according to kind of service rendered			
		Super- visors	Staff	Total	General- ized service	Communi- cable diseases	Tuber- culosis	Venereal diseases
Group I.....	10	118	1,276	1,394	98,629	466,227	373,292	7,548
Group II.....	14	17	316	333	8,204	84,289	73,698	15,358
Group III.....	33	35	424	459	75,413	77,751	85,821	7,726
Group IV.....	13	4	90	94	14,765	36,257	12,913	235
All cities.....	70	174	2,106	2,280	197,011	664,524	545,724	30,867
Per cent of total visits.....					5.0	16.9	13.9	0.8

	Nursing visits classified according to kind of service rendered				Average number of visits per nurse (all) ¹	Average number of visits per staff nurse	Average number visits per 100,000 popula- tion
	Child welfare	School hygiene	Miscel- laneous	Total visits			
Group I.....	774,603	642,271	114,563	2,477,133	1,777	1,941	15,879
Group II.....	162,916	133,105	7,378	484,948	1,456	1,531	9,746
Group III.....	365,381	164,888	33,284	810,264	1,765	1,911	15,829
Group IV.....	67,694	17,019	940	149,823	1,594	1,654	12,773
All cities.....	1,370,594	957,283	156,600	3,922,168	1,720	1,862	14,425
Per cent of total visits.....	34.9	24.4	4.1	100			

NUMBER OF NURSING VISITS REPORTED FOR CERTAIN SPECIFIED SERVICES :

	General- ized service	Communi- cable diseases	Tuber- culosis	Venereal diseases	Child welfare	School hygiene
Number of cities.....	3	21	30	10	21	19
Total visits reported.....	77,855	571,917	269,499	16,824	651,630	638,009
Total number nurses.....	30	293	153	24	352	578
Average number visits per nurse.....	2,595	1,952	1,766	701	1,851	1,104
Highest number.....	2,910	3,772	3,150	2,075	3,540	2,434
Lowest number.....	1,902	650	915	175	747	187

¹ Based upon all nurses employed.

² The number of nursing visits for certain specified services are given for those cities reporting number of visits and the number of nurses specifically assigned. In some instances, apparently, only part-time service was given.

Table IV was prepared to show the number of nursing visits, classified according to certain specified kinds of service, based upon the data reported for 70 cities. Totals and averages are presented by population groups as this procedure tends to smooth out some of the incompleteness and apparent inaccuracies in the figures reported. The number of "visits" given for each kind of nursing service did not always appear to correspond to the number of nurses definitely reported as assigned to these services. Failure to qualify or define the "visit" discounts greatly the value of any such compilation as is presented in the above table.

In the absence of more reliable data, Table IV furnishes a reasonably satisfactory estimate of the average number of visits

made in a selected group of large cities. Including all nursing personnel engaged in health department work in the 70 cities, there was reported an average of 1,720 visits per nurse, or 1,862 visits for each staff nurse employed. On the basis of 100,000 population there was an average of 14,425 nursing visits reported during 1923.

When the average total number of visits per nurse were grouped according to size of city it was found that Group II, comprising 14 cities having from 250,000 to 500,000 population, gave a relatively low average compared to the records for all other groups, namely, 1,456 visits per nurse. This low average is due chiefly to the fact that the reported visits for three cities probably represented incomplete records.

The number of visits per staff nurse shows considerable variation. The highest record was for Des Moines, 4,031 reported visits per nurse. Other high averages were Cleveland, 4,173; Canton, 3,351; Toledo, 2,806. On the other hand, the averages for a few cities computed on the basis of the figures given by the health departments at the time of the surveys were strikingly low, as for example, Portland, 187; Lynn, 286; Bayonne, 400; Paterson, 529; Harrisburg, 700. It was quite obvious that these figures alone should not, perhaps, be used in a quantitative comparison of the nursing service provided in different cities.

Similarly there was a wide variation in the number of visits per 100,000 population. Baltimore stands at the top of the list with 51,646 reported visits; Bridgeport reported 46,871 visits; New Bedford, 43,044; Cleveland, 39,471; Milwaukee, 27,359. For extremely low averages, Bayonne reported 476 visits per 100,000 population; Harrisburg, 854; Kansas City, Kans. (one nurse), 1,565.

The total number of nursing visits reported for the 70 cities was 3,922,168. The percentage distribution of these visits according to the kind of service primarily rendered is also given in Table IV. It should be noted that the greatest frequency of this distribution falls in the column listed as child welfare, which includes prenatal, infant, and preschool activities. School hygiene is credited with 24.4 per cent of the total visits, followed by communicable disease control 16.9; tuberculosis, 13.9; while 5 per cent of the reported visits were listed as performed in a generalized service and 4.1 per cent scattered through various minor activities or unclassified.

In attempting to classify nursing visits and credit them to specific activities, it was obvious that such a classification was, at times, impracticable if not impossible. For the most part, however, the figures given in Table IV are fairly indicative of the distribution of visits according to the specified activities. In practice there is not always a definite differentiation between different kinds of service and the percentage distribution of visits is somewhat mis-

leading. Visits credited to communicable disease control undoubtedly include service rendered in the control of tuberculosis. The figures given under venereal diseases probably include patients' visits to clinic. Child welfare and school hygiene are often a combined service although the reports indicate the distribution of visits as given in this table. Generalized nursing visits represent service rendered in other specified activities.

In order to present a comparison of the average number of visits per nurse as reported for major activities, it was found possible to include only the records of certain carefully selected cities for which fairly reliable data were given. In Table IV the number of visits per nurse for specified services are given in smaller groups of cities, these figures being also included in the totals used above. According to these data nurses (in three cities) working under a generalized plan reported an average of 2,595 visits per nurse, a higher record than shown in any of the specialty columns. In communicable disease work (21 cities) there was reported an average of 1,952 visits per nurse; in child welfare, 1,851 visits; tuberculosis, 1,766; school hygiene, 1,104. For venereal diseases the reported average of 701 visits per nurse is probably not confined entirely to field follow-up visits. The extreme variations in reported visits per nurse are also given. The low figures for venereal diseases and school hygiene in a few cities are not readily explainable from the information recorded in the schedules.

2. PUBLIC HEALTH NURSING PROVIDED THROUGH OTHER MUNICIPAL DEPARTMENTS

In addition to the public-health nurses on duty in departments of health and those engaged in school work under the jurisdiction of the educational authorities, the surveys for 1923 recorded 235 public-health nurses assigned to other municipal departments or financed chiefly by municipal funds.

Total number of municipal public-health nurses reported for the 100 largest cities in 1923

	Total number of nurses	Per cent of total
Health departments.....	2,357	68.1
Boards of education.....	869	25.1
Other municipal departments.....	235	6.8
Total.....	3,461	100.0

According to the above summary, a total of 3,461 public-health nurses were reported as rendering municipal service in 1923. Of this number 68.1 per cent were provided by health departments, 25.1 per cent by boards of education, and 6.8 per cent by other

departments. The services rendered by the 235 nurses included in this total were practically identical with those given by health-department personnel, but for some administrative reason these nurses were assigned to other central authorities in four cities.⁶ In each of the six cities reporting such an arrangement there was a distinct division of responsibility as regards nursing activities that are quite universally accepted as proper functions of a central health authority. Such a division of responsibility does not appear to be a sound administrative policy even though these different services may be well coordinated.

Municipal public health nursing activities outside the health department

	Nurses
Bayonne, bureau of child hygiene-----	3
Boston, Boston sanatorium department-----	34
Chicago, municipal tuberculosis sanatorium-----	145
Houston, social service bureau-----	8
Oklahoma City, public-health nursing bureau-----	11
St. Louis, hospitals department-----	34
Total-----	235

Bayonne, N. J.—In Bayonne the bureau of child hygiene, with 3 nurses, organized in the department of public affairs and distinctly separated from the health department, is responsible for all official activities undertaken for the promotion of child health. The health department also provided one nurse, who undertook a generalized service. School health supervision is carried on independently by the school authorities. There are, therefore, in this city three distinct authorities charged with public-health responsibility.

Boston, Mass.—The Boston sanatorium department carries on all municipal activities undertaken in that city for the control of tuberculosis, including the services of 34 nurses assigned to field duty. (A total of 52,618 visits were reported for 1923.) The city health department reported no activities in this field.

Chicago, Ill.—The municipal tuberculosis sanatorium in Chicago, in addition to a 950-bed sanatorium, operated tuberculosis dispensaries and provided a field nursing service. The control of tuberculosis in Chicago is, therefore, a function of this municipal department which is entirely distinct from the health department, although the commissioner of health is director of the sanatorium. For 1923 there were reported 239,247 home visits with a total nursing staff of 145 nurses.

Houston, Tex.—The social service bureau in Houston was reported as a semiofficial organization receiving its financial support in part from the community chest and in part from the city appropriations.

⁶ Bayonne, Boston, Chicago, St. Louis.

In 1923 this bureau received \$33,900 from the city, \$37,250 from the community chest fund, and \$4,248.54 from special donations, making a total budget of \$75,398.54.

Among other functions of this bureau, there is a department of public-health nursing, with 8 nurses and 1 clerk. The salaries of 4 additional nurses are paid by the board of education and the school health work is carried on by the bureau, which also furnishes all public-health nursing provided by the health department. This nursing division was charged with an expenditure of \$15,701.93 in 1923.

The following nursing services were reported for 1923: Total number of patients, 8,197; total nursing visits, 13,214; 30 visits to 217 prenatal cases; 30 mothers' conferences with a total attendance of 576; 2 health conferences. In the report on school work, provided by 11 nurses, a total of 1,800 visits were made to 58 schools; 48,688 examinations for contagion and 24,430 physical examinations; 6,638 defects were found, and 2,671 reported as corrected; 5,528 home visits were made.

Oklahoma City, Okla.—In the department of public affairs in Oklahoma City there is organized a public-health nursing bureau and the welfare board, while the health department is part of the department of public safety. The office of this association is located in the city hall, and in 1923 this bureau employed 1 director, 2 supervisors, and 8 staff nurses, with a total expenditure of \$29,186, of which \$24,234 was for salaries. Of the total reported annual expenditure, \$23,138.78, or nearly 80 per cent, was derived from municipal funds. Although, strictly speaking, this association is a private agency it functions, for all practical purposes, as a municipal nursing service and for this reason has been included in the present group.

All of the nursing services usually provided by health departments are supplied by this special nursing bureau. The health department in 1923 also had one nurse who performed some office work in addition to certain duties in connection with communicable disease control. The special nursing bureau carried on all other nursing activities including some antituberculosis work, attendance at 5 infant welfare clinics and nursing relief furnished to beneficiaries of the welfare board. For certain school-nursing activities the board of education provided \$4,650 in 1923 for the services of 5 nurses supplied by the nursing bureau.

St. Louis, Mo.—In St. Louis the department of public affairs contains a health division (health department) and a hospital division. In 1923 there were no nurses on duty in the health department, but in the hospital division there were 34 public-health nurses who divided their time between tuberculosis and infant welfare, the hospital authorities having supervision over these activities.

In the hospital division there is a municipal nurses' board, employing visiting nurses, and operating health centers, which include provisions for 3 prenatal, 10 baby, and 11 tuberculosis clinics. The nurses assist at the clinics and in 1923 reported 35 field visits for prenatal cases, 2,653 home visits to patients cared for at the tuberculosis clinics, and follow-up visits to 12,671 infants and children attending the baby clinics.

The board of education employed 28 nurses in 1923 for school health work carried on under the management of the board, reporting an expenditure of \$46,425 for nursing activities.

TABLE V.—Total number of all municipal public-health nurses (exclusive of hospital nurses), classified by population groups and by department in charge, 100 cities, 1923

Population groups	Total population	Number of nurses in—			Total number of municipal nurses	Average number of nurses per 100,000 population	Variations in number of municipal nurses per 100,000 population	
		Health department	Education department	Other departments			Highest	Lowest
Group I (12 cities).....	17,340,198	¹ 1,425	265	213	1,903	10.9	Detroit..... 19.9	Pittsburgh.... 6.4
Group II (16 cities)....	5,579,138	² 333	234	-----	567	10.2	Rochester..... 17.6	Portland..... 1.8
Group III (50 cities)...	7,310,202	³ 495	275	19	789	10.8	Yonkers..... 20.6	Dallas..... 3.8
Group IV (22 cities)...	1,915,525	⁴ 104	95	3	202	10.5	Schenectady.... 26.3	Harrisburg.... 3.6
100 cities.....	32,145,063	2,357	869	235	3,461	10.7	Schenectady.... 26.3	Portland..... 1.8

¹ Eleven cities included. No nurses in health department in St. Louis.
² Fourteen cities included. No nurses in health department in Columbus, Kansas City, Mo.
³ Forty-four cities included. No nurses in health department in Fort Worth, Houston, Tulsa, Youngstown, Tacoma and Wilmington omitted. The social service bureau in Houston and the public health nursing bureau in Oklahoma City are included.
⁴ Seventeen cities included. No nurses in St. Joseph, Sioux City, Wichita, Wilkes-Barre. Fort Wayne excluded.

In Table V there is presented a record of all the municipal public-health nurses reported for the 100 large cities in 1923, exclusive of hospital nurses. The average number of municipal nurses per 100,000 is 10.7, as compared with 8.0, as applied only to nurses on duty in health departments.

TABLE VI.—Expenditures for all municipal public health nursing (exclusive of hospital nurses), total reported expenditures and average per capita cost, by population groups, 100 cities, 1923

	Total reported expenditures	Average cost per capita (cents)	Variations in per capita costs (cents)	
			High	Low
Group I (12 cities).....	¹ 2,450,407	¹ 14.7	Cleveland..... 25.4	Pittsburgh.... 7.1
Group II (16 cities).....	908,670	16.3	Minneapolis.... 34.3	Portland..... 5.2
Group III (50 cities).....	² 1,169,099	² 16.9	Yonkers..... 46.8	Dallas..... 5.7
Group IV (22 cities).....	280,896	14.6	Schenectady.... 36.7	Peoria..... 4.7
Total, 100 cities.....	³ 4,809,072	³ 14.9	Yonkers..... 46.7	Peoria..... 4.7

¹ Los Angeles omitted. ² Camden, Hartford, and Youngstown omitted. ³ Total cost data for 96 cities

The total reported expenditures for all classes of municipal public-health nursing is shown in Table VI for the 96 cities for which this item could be satisfactorily computed. The average cost per capita varies slightly for the different population groups, with fairly wide variations in individual cities. The average per-capita cost of 14.9 cents in 96 cities as compared with 12.1 cents as the average cost of health-department nursing in 79 cities (Table I) shows that 2.8 cents per capita was expended by other municipal departments for public-health nursing.

3. PUBLIC-HEALTH NURSING SERVICES PURCHASED FROM PRIVATE AGENCIES

In addition to the provisions for public-health nursing credited above to health departments, boards of education, and other municipal departments, a number of cities reported varying allotments of funds to private organizations for certain kinds of public-health nursing. These items of expenditures are either charged to the budget of the health department or listed as special appropriations.

The details of the arrangements made with private agencies for the purchase of nursing service were frequently lacking in the records for 1923. In Columbus the health department reported that a division of nursing was created in April, 1923, under an arrangement by which the health department paid the district nursing association one-half the salaries of 1 chief nurse and 14 staff nurses, in return for which the department was furnished certain nursing services. No nurses were employed directly under the health department. Denver reported the payment of the salaries (\$2,400) of two nurses belonging to a private nursing organization. Des Moines paid the salary of one nurse provided by a private agency and Evansville reported a similar expenditure of \$2,500 for prenatal, infant, and preschool nursing service furnished by a private nursing organization.

In Hartford, the nursing service provided for all child-health activities was supplied by the visiting nurses' association in return for an allotment of \$27,000, which paid for the maintenance of 1 supervisor, 1 nutrition worker, 10 nurses, and 5 part-time physicians, their services being utilized in the operation of 5 health stations and for home visiting. Omaha reported that the city paid for the services of two tuberculosis nurses supplied by a private agency. In Portland an allotment of \$7,500 was made to a private agency for nursing service in connection with tuberculosis and communicable-disease control, the expenditure not being charged to the health department. In Reading the city paid half the salaries of 30 nurses and 9 part-time physicians provided by a visiting nurse association

and through this organization the health department conducted its child welfare and public health nursing activities.

The Wichita public health nursing association supplied all the nursing service provided except that in connection with school-health supervision which was under the control of the board of education. For these services an allotment of \$15,075.02 was made from city funds without exercising any direct supervision over the work of the nurses according to the report for 1923. In Wilkes-Barre, the city contributed \$1,800 to the support of a State clinic. Wilmington reported \$1,600 paid to the visiting nurses' association for certain daily inspections in the schools through part-time (one hour daily) service of 10 nurses.

In Norfolk the department of public welfare, which includes the health department, allotted \$4,000 toward the maintenance of a clinic operated by the King's Daughters in return for various charity, social, and medical services, including public-health nursing. Utica appropriated \$17,900 to several nonofficial agencies engaged in the following activities: Tuberculosis, a venereal-disease clinic, baby welfare, day nursery, and a dental infirmary. The amount of nursing service provided is not mentioned. In San Antonio the chamber of commerce pays the salaries of two public-health nurses and \$1,200 toward the salary of the supervisor of nurses in the health department.

Including those cities which purchased more or less public-health nursing service from private agencies and the city of St. Louis, which provided this service through the hospital division, there were 93 out of the 100 large cities in 1923 providing some public-health nursing. One additional city (Fort Worth) has since reported (1926) the organization of a public-health nursing service of eight nurses, and Wilkes-Barre reports a reorganization of the local public-health service.

4. FACILITIES FOR DEPARTMENTAL TRAINING OF PUBLIC-HEALTH NURSES

The qualifications that should be prescribed for the position of public-health nurse require training and experience usually beyond that attained by the average nurse recently graduated from her hospital school. In addition to knowledge of bedside technique, the public-health nurse must qualify herself in various phases of public-health work. Nursing care of the sick serves largely as a means of contact with the homes. The health department nurse to-day becomes one of the essential agents in health-promotion campaigns and it is through her home visits that the health officer must extend his health education program.

Obviously then, the newly appointed nurse, fresh from her hospital training, should receive intensive, practical training in the public-health aspects of health-department practice. As a matter of fact, very few systematic efforts seem to have been made in this direction. Forty-five of the one hundred large cities reported for 1923 that no facilities were available for training public-health nurses. This number probably includes cities in which no serious attempt was made to train the nursing staff. No information on this item was recorded for 11 cities and in 12 others no public-health nurses were on duty in the health departments.

In the remaining 30 cities the reports for 1923 indicate that some consideration had been given to the problem of public-health nursing training, although it was not always possible to determine the character of the facilities provided or made available, and rarely was mention made of the number of nurses that received some benefits, directly or indirectly, from special training. Meager as this information is, the following reference to the reports will give some idea of the extent to which special training was available in 1923. Where certain facilities were reported it was not always clear whether they were utilized by municipal nurses or merely represented potential means of training.

The reports from Boston and Cambridge indicate that public-health nurses in those two cities took some advantage of the training facilities offered by the school for public-health nursing conducted by the community health association in connection with Simmons's College. Postgraduate courses in public-health nursing were offered by local hospitals or universities in Cincinnati, Cleveland, Detroit, Elizabeth, Jersey City, Milwaukee, Minneapolis, Oakland, St. Paul, and San Francisco.

Nurses from local hospitals received special public-health training through facilities offered by the health department in four cities. In Allentown the health officer lectured to nurses in the local hospital and followed this course with two weeks' practical field work. In Columbus the health department provided training for pupil and student nurses from a local hospital and the State University. A two months' course was offered by the health department in Lawrence to nurses in training at the general hospital, and nurses at the city hospital in Reading were offered a two months' course of field training with the health department.

In the reports of only four cities (Akron, Baltimore, Chicago, Detroit) was there any definite statement to the effect that newly appointed nurses received special instruction or training. Akron, with a relatively large staff of nurses for a city of its size, reported that department nurses were "trained by supervisor and director."

There were two teaching supervisors in Baltimore. In Chicago newly appointed nurses were reported as receiving a three months' course in training by supervising nurses. In order to secure a personnel capable of generalized nursing in one special district, Detroit reported that it was necessary to provide special training for nurses assigned to this district.

Teaching districts were established in at least three cities—Los Angeles, Nashville, Pittsburgh. Here nurses, after appointment, received special training in field work. The teaching center in Nashville was established in connection with the activities of Peabody College, and in Cincinnati it was affiliated with the University Medical School, which offered a three months' training course.

Five cities reported that special courses of lectures were given department nurses, either by the health officer, division chiefs, or other members of the staff (Allentown, Birmingham, Memphis, Milwaukee, Norfolk). In Birmingham the lecture course included field demonstrations. In Memphis the health officer, in 1923, gave a six months' course of lectures to department nurses, and new nurses received a three months' probationary appointment under the direction of older nurses, at the end of which time those found competent and otherwise satisfactory were given permanent appointments. In Milwaukee lectures were given by chiefs of various divisions and privilege granted to attend special lectures in public-health courses given by the antituberculosis association.

Weekly conferences of nurses were mentioned in the report from Dayton and, while not specifically reported for other cities, various plans of conferences, either general or by special groups, have been adopted in a number of cities. Well-organized conferences undoubtedly are profitable and helpful in establishing better nursing technique and a more uniform service.

Special training in communicable-disease hospitals for health-department nurses was reported for Worcester and Yonkers. In Worcester this training was of six weeks' duration.

Information concerning training facilities in four other cities was quite meager. For Buffalo they were recorded as "fair"; for New York City, "excellent"; some provision was apparently made in Toledo; in Trenton a three months' probationary appointment indicated some effort to train newly appointed public-health nurses.

The present review of the facilities provided for nursing training in the present group of cities is undoubtedly incomplete, but it will serve, nevertheless, to emphasize the inadequacy of existing provisions. Reports received from a number of cities indicated that

health departments frequently have experienced difficulties in securing adequately trained public-health nurses, especially nurses equipped or experienced sufficiently to undertake generalized district nursing, as in the case of Detroit referred to earlier in the present chapter.

In the absence of well-trained and experienced personnel, health officers are forced to rely upon individual training after appointment, and as a consequence more adequate provisions for special training are manifestly urgently needed in many cities. Lack of uniformity in the theory and practice of public health nursing has been a decided handicap and a rather heavy turnover of personnel has served also to complicate the problem of providing a satisfactory nursing service.

There appears to be no immediate solution of this perplexing problem, and even though the facilities for voluntary training in public health nursing are increased health officers will still be confronted with conditions similar to those now experienced. For the present, at least, more adequate provisions should be made for training newly appointed personnel in order to fill vacancies and make further expansion of this service possible.

5. PUBLIC HEALTH NURSING BY PRIVATE AGENCIES

In the survey of the 100 large cities, completed by the United States Public Health Service in 1924, the information and data concerning the activities of nonofficial nursing agencies gave no reliable index, statistically or otherwise, of the extent of the service rendered by the private agencies. It was possible in many instances merely to supply a record of the various organizations. In the larger cities with innumerable nursing activities and especially in those cities in which there was no central alliance of the existing agencies, the task of attempting to report upon the character and scope of their services was prohibitive.

Private nursing organizations and other health agencies have made valuable contributions to the development of such community activities as maternal and infant welfare, child hygiene, and the control of tuberculosis. They have rendered invaluable service in clinics and in supplying nursing care for the sick. Through their efforts there has been demonstrated the public need for an adequate nursing service in every community and as a result municipal authorities have recognized the fact that public health nursing is an essential asset in modern health administration.

Although the recent survey (for 1923) accomplished little more than to record the number of private nursing organizations existing

in the large cities and to classify the majority of them according to the kind of services rendered, sufficient information was obtained to warrant the following general conclusions. A majority, probably nearly 90 per cent, of the nurses provided by private agencies rendered some bedside care of the sick in their homes. The same or even a larger proportion were engaged in some form of maternity service. They were also active in antituberculosis work and in various fields of infant and child welfare. As a rule this group of nurses played a relatively small rôle in school health supervision. Compared with the activities of the municipal nurses, the private agency nurse did less preventive and more curative nursing. Instructive nursing and health teaching in the homes have added to the value of her services so that she has become a very potential factor in the development of a community health service.

The private nursing organization will continue to find a place in the program of community welfare although there is a growing tendency for the official health authorities to assume leadership in all public-health fields and to take over community health functions already developed by other agencies. Lack of centralized direction of nursing resources undoubtedly has been responsible for too much duplication of efforts and not infrequently for unbalanced community programs. Until every community has provided for itself an adequate nursing service under municipal administration there should be maintained cordial and mutually helpful relations between the public authorities and the private nursing agencies.

ESTIMATE OF PUBLIC AND PRIVATE RESOURCES

A fairly complete census of public-health nurses on duty under municipal auspices in the 100 large cities was obtained by the survey for 1923. A total of 3,461 nurses were reported. (See summary, p. 373.) Incomplete returns for the private nursing agencies in this group of large cities appear to warrant an estimate of at least 2,500 public-health nurses who were rendering various services under the leadership of nursing agencies, antituberculosis societies, life insurance companies, and other similar organizations. Such an estimate is undoubtedly less than the number actually employed.

On the basis of this estimate and the reported number of public-health nurses on duty under municipal authorities, the total number of public-health nurses serving the 100 large cities in 1923 was probably in excess of 6,000. With a population in excess of 32,000,000, it is obvious that the average city in the present group was provided with less than half the nursing service usually considered as reasonably adequate, namely, one nurse for each 2,000 of population.

THE FUTURE OF PUBLIC-HEALTH NURSING

Whatever the future may hold in store for public-health nursing as a community problem, it has become definitely established as one of the essential functions of municipal health service. Health department personnel will be required to expand and extend their activities in this important field and to provide more adequately for the nursing facilities needed in their respective jurisdictions.

Responsibility for the administration of the services now provided by different agencies is usually a divided one. In order to bring about the greatest possible economy of available resources some form of a central nursing committee, its membership composed of representatives of all nursing agencies, appears to be an ideal plan. Such a central clearing house, under wise leadership, should serve to prevent much duplication of effort and, with the present inadequate personnel, render still greater service.

The present discussion does not attempt to suggest any decision concerning the agency, official or private, that is best suited to assume the direct responsibility for each type of service rendered by public-health nurses. In any plan intended to further develop public-health nursing as a community asset, health-department executives should become active participants in promoting and directing the development of a service that will most effectively fulfill the requirements and needs of their respective communities.

GENERAL SUMMARY AND CONCLUSIONS

Although many rather essential principles in the theory and practice of public-health nursing have been fairly definitely established, the methods and procedures now carried on in different cities under the general classification of public-health nursing are so varied that it is difficult to present a comparative statistical analysis of the service rendered or to formulate definite conclusions. Each review of this important phase of municipal health service shows encouraging progress and strengthens the opinion that public-health nursing has become a distinctly community function and public responsibility.

The present analysis, based upon the records for 1923, warrants the following general conclusions which are presented as an attempt to summarize the conditions existing in that year. During the time intervening between the survey and the publication of this report, further encouraging progress has been reported in individual cities. Data and information now available indicate, however, the need for a more critical analysis of all phases of this activity with careful interpretations of all the findings in order to advance the art and science of public-health nursing.

1. In 24 of 85 cities public-health nursing was reported to be organized as a separate bureau or division of nursing. In the other cities the nursing staff was distributed in various combinations with major activities, in some cities carrying on such functions as child welfare, in others assigned to one or more divisions, occasionally with some attempt at centralized supervision, but frequently responsible only to the chief of the division to which they were assigned.

Administrative supervision over the nursing personnel was exercised by a director or supervisor of nurses in only 33 out of 81 cities, by the medical chiefs of divisions in 21 cities, by the health officer or his assistant in 22 cities. In 5 cities there appeared to be no professional supervision provided.

The average number of nurses per supervisor was 12.47, with variations from 11.1 to 25.0.

The problem of administration and supervision of public-health nursing activities did not seem to have received sufficiently serious consideration as a rule, and the experiences of different cities and different executives have brought forth arguments and opinions expressing opposing views as to the most satisfactory solution of this problem. It seems logical to propose some scheme of centralized supervision under a qualified nurse supervisor or director who is made responsible for the conduct of all nursing activities. Under the so-called generalized nursing plan it is equally logical to propose that supervisors experienced in the major specialties be made available for consultation and general oversight of problems arising in connection with special fields of nursing.

The exact plan of organization and the details of administration will undoubtedly be influenced by local conditions. Supervision over a generalized nursing service will probably differ from that found to be satisfactory with a specialized service. The desirability of placing the nursing groups under medical supervision should be further considered.

2. In practically all of the health departments employing public-health nurses, only graduate nurses were considered for appointment. In 36 cities, appointments were regulated by civil-service rules, directors and supervisors sometimes being exempted from this requirement.

Very few cities prescribed any special experience or previous training as a qualification for appointments, which were frequently made by or upon the recommendation of the health officer, although choice of applicants was occasionally left to the supervisor of nurses.

3. More adequate clerical assistance is needed in order to relieve the nursing personnel of routine office work. The present survey, however, did not offer any solution of this problem. In the 24 cities

having more or less separate nursing bureaus, clerical assistance was provided on an average ratio of 1 clerk to each 18.8 nurses.

4. In 1923, approximately 6,000, or one-half of all public-health nurses on record in the United States were rendering service in the 100 largest cities. According to data presented, nearly 60 per cent of these nurses were on duty in various municipal services while about 40 per cent were serving under private auspices.

Of the 3,461 public-health nurses engaged in municipal services in 1923, 2,357, or 68 per cent were on duty in the health departments in 85 cities; 25 per cent were serving with boards of education in 70 cities; and the remaining 7 per cent were assigned to other municipal departments in 6 cities.

In health-department service in 85 of the 100 large cities there was, in 1923, an average of 8.0 nurses per 100,000 population. The average for all municipal nurses (100 cities) was 10.8. Including the public-health nurses on duty in private agencies the general average for 1923 was in excess of 18, or a definite increase over the average ratio reported for 1920 (16.5).

It is evident that the average provision for public-health nursing in the cities under consideration does not very closely approach the numerical standard proposed by various authorities and writers, namely, 50 nurses for each 100,000 of the population, or one nurse for each 2,000 of persons to be served.

5. The cost of public-health nursing, under health-department management could be fairly satisfactorily computed for 79 cities. Expenditures were often concealed in the allotments made for other activities and cost-accounting systems were obviously poorly developed as a rule and lacking in details.

An average of 21.9 per cent of the expenditures charged to the health department (exclusive of hospital management and the cost of garbage disposal) was credited to public-health nursing, with wide variations from 6 to over 50 per cent. The average cost in cities with separate nursing bureaus was 29 per cent of the total health department expenditures.

The average per capita cost for public-health nursing for the group of 79 cities was 12.1 cents, varying from 1.7 cents to 35.7 cents. The average cost per nurse employed was \$1,513.

According to the data collected in 1920 and 1923, there was an increase from approximately 10 cents to 12 cents per capita in this 3 year period.

6. The character and scope of service rendered by the public-health nurse embraces a great variety of duties and functions, from the administration of such important activities as child welfare to the performance of all sorts of service in practically all phases of health work.

Approximately 27 per cent of all nurses on health-department duty in 88 cities in 1923 were engaged in school health supervision; 21 per cent in infant-welfare activities, including prenatal, infant, and preschool work; 10 per cent in communicable-disease control (general); 9 per cent in antituberculosis service; 9 per cent in the control of communicable diseases other than tuberculosis and venereal diseases; 4 per cent in combinations of infant welfare and school hygiene; 3 per cent in venereal diseases; while 19 per cent were giving largely a generalized service.

A percentage distribution of cities according to the kinds of nursing service provided by the health department reveals the fact that only about 50 per cent (of 88 cities) in 1923 had organized a nursing service for infant-welfare activities. Slightly over half of these cities (52.3 per cent) provided some nursing service for communicable-disease control. Thirty-seven cities reported some nursing facilities in the field of tuberculosis, although only 9 per cent of the total nursing personnel was assigned to this important field activity. Over one-half (55.7 per cent) of these cities made some provision for a nursing service in venereal-disease control, but only 3 per cent of the nursing staff was so assigned.

Taking into consideration the nursing service provided by boards of education, other municipal departments, and the services maintained by private organizations, the latter contributing largely to maternal and infant welfare and tuberculosis, the present analysis serves to indicate that many municipal authorities have failed to make adequate provisions for nursing service in many essential community problems.

7. In only 12 cities was the nursing service reported as organized on the so-called generalized nursing plan, and some of these cities continued to assign part of the nursing staff to selected specialties. In 17 cities there were various combinations of generalized and specialized services, while in 56 cities nursing activities were usually entirely specialized.

In order to give trial to the generalized district plan two cities reported that it had been applied to a special ward or district. One of the most serious obstacles to the adoption and success of this plan appears to have been the difficulty of securing an adequate number of nurses qualified to undertake a generalized service.

The experience of at least one city would indicate that greater service per nurse or per unit of cost can be expected under the generalized plan on the basis of number of visits per nurse.

8. The general character of public health nursing service provided under municipal direction has developed a tendency to emphasize the importance of so-called instructive nursing and to discourage

the rendering of bedside care. The modern conception of public health might readily embrace the cure of disease along with its prevention, and the reports from a number of cities indicate that some attempt was made to provide facilities for bedside care of the sick. While a satisfactory balance between these two types of services—instructive and bedside—may be difficult to adjust, the introduction and expansion of preventive or instructive nursing undoubtedly profits immeasurably by applying it in the guise of bedside nursing without confusing it with charity. Many phases of the technique of bedside nursing lend themselves quite readily to demonstrations in instructive health lessons.

While private nursing agencies undoubtedly will continue to furnish the bulk of the bedside nursing needed in a community, these agencies have already recognized the importance of combining practical public and personal health instruction with bedside care.

To avoid conflict between the activities of the public and private nursing agencies, there should obviously be established the greatest possible coordination between these two groups. In the best interests of the public health there should be a complete understanding and, as far as practicable, a pooling of the resources of all the agencies engaged in furnishing nursing services, preferably under the general leadership and direction of the local health officer. Such an arrangement favors the utilization of all resources to the best possible advantage.

9. The nursing "visit" is practically the only unit of measure that is reported as an indication of the amount of service rendered. The visit is, however, unstandardized and represents a poor index of the quality or quantity of service.

The total number of nursing visits reported for 70 cities was 3,922,168, credited to 2,280 nurses, or an average of 1,862 visits for each field or staff nurse. The average number of visits per 100,000 population varied from 9,746 in Group II to 15,879 in Group I, with an average of 14,425.

Approximately 35 per cent of all reported visits were recorded in child-welfare activities; 24 per cent in school hygiene; nearly 17 per cent in communicable-disease control; about 14 per cent in tuberculosis work, while 5 per cent were recorded as generalized, and slightly over 4 per cent for miscellaneous activities, with less than 1 per cent for venereal-disease control.

The average number of visits per nurse in different activities varied considerably, as might be expected, and depended upon the kind of service rendered, the efficiency of the individual nurse, and many local and other conditions. According to the reports for

1923, the following averages were reported: For communicable diseases, 1,952 visits per nurse per annum; child welfare, 1,851; tuberculosis, 1,766; school hygiene, 1,104; venereal diseases, 701. In 3 cities 30 nurses on generalized duty reported an average of 2,595 visits each.

Any conclusions drawn wholly upon the number of visits reported are probably misleading and do not form a sound basis for any qualitative or quantitative estimate of the character or extent of the service actually rendered. The present survey emphasizes the need of a more critical analysis and interpretation of many of the facts involved in this important activity.

10. In addition to the 2,357 public-health nurses reported for 85 of the large cities in 1923, there were 869 nurses engaged in school hygiene activities under boards of education and 235 other nurses assigned to field nursing in other municipal departments or supported chiefly by municipal funds.

In the 6 cities reporting the employment of municipal public-health nurses in "other" departments, there appeared to be a distinct division of responsibility as regards nursing activities that are quite universally accepted as proper functions of a central health authority.

In addition to the service rendered by nurses serving in various municipal departments in 1923, at least 12 cities purchased some service from private nursing agencies. In 5 of these cities all of the public-health nursing provided by the municipal authorities was rendered by the subsidized agencies.

Taking into consideration the services furnished by private organizations, some sort of public-health nursing facilities were available in all of the 100 large cities, although many of them faced inadequate provisions.

11. Facilities for departmental training of public-health nurses continue to be woefully inadequate, less than half of the cities in the present group making any provisions for the training of newly-appointed personnel. Teaching districts were reported for only 3 cities, although somewhat similar provisions may have been made on a smaller scale in a few other cities. Relatively few cities reported weekly conferences, and systematic lecture courses were arranged in only a few instances.

The training of public-health nursing personnel constitutes one of the most serious problems confronting the health executive to-day. Associated with it is the problem of an adequate, efficient corps of supervising nurses.

12. Private nursing organizations have made valuable contributions to the development of the community health program by dem-

onstrating the need for adequate nursing service in every community. Through their efforts largely the public-health nurse has become one of the most valued agents of the health department. These private agencies will continue to find a place in community welfare, although there is a growing tendency for the official health authorities to assume leadership in all public-health fields and to take over services developed by other health agencies.

XIII. PUBLIC-HEALTH LABORATORIES

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The application of laboratory methods to public-health practice during the last half of the nineteenth century paved the way for an important development of public-health laboratory service throughout the United States. Of the 100 large cities surveyed in 1923 all had the benefit of laboratory service, although the means of provision and the plan of organization varied considerably.

GENERAL ORGANIZATION

Four cities¹ had no municipal laboratory, but depended entirely upon State or county laboratories, while in 7 others² the work was handled in local laboratories on a contract basis. In each of the remaining 89 cities special quarters were provided in public buildings, usually (52) in the city hall.

Seventy-five cities maintained a laboratory for the examination of diagnostic as well as other types of specimens, both chemical and bacteriological; but in 9 of them³ the work was limited and many of the examinations were apparently carried on by State laboratories. Two laboratories⁴ served both city and county, while 2 others⁵ performed examinations for the city and State combined. Nine cities⁶ had a bacteriological laboratory and a separate chemical laboratory which was usually under the bureau of food and drugs. In these cities the work of the two laboratories is usually separated, as are the finances and personnel, but whenever available the combined figures have been used in this study.

ESTABLISHMENT

The laboratory movement has been a somewhat gradual one, as shown by the dates of establishment of 74 of the 89 municipal laboratories functioning in 1923. According to information fur-

¹ Bayonne (uses Jersey City laboratory), Duluth (State laboratory in city), Paterson, and Wilkes-Barre.

² Albany, El Paso, Evansville, Richmond (contract with State), Schenectady (contract with Ellis Hospital), South Bend, and Utica (contract with State hospital).

³ Cambridge, Fall River, Jacksonville, Lawrence, New Bedford, Somerville, Springfield, Trenton, and Wilmington.

⁴ Birmingham and Camden.

⁵ New Orleans, Memphis (city and western Tennessee), and Providence.

⁶ Baltimore, Cleveland, Harrisburg, Indianapolis, Jersey City (county bacteriological), Kansas City, Mo., New York, Philadelphia, and St. Louis.

nished the surveyors, 9 were established prior to 1895,⁷ 13 between 1895 and 1900, 13 between 1900 and 1905, 9 between 1905 and 1910, 9 between 1910 and 1915, 12 between 1915 and 1920, and 9 between 1920 and 1925. From 1 to 4 laboratories were established in each of the years during this period with the exception of the years 1911 and 1922 when there were none, and 1904 when there were 5. The laboratories at Fort Worth, Tulsa, and Wilmington were established during the year of the survey. It should also be noted that Paterson has established a well-equipped laboratory since that time. While there is still considerable variation in the scope and volume of work performed, and a striking lack of standardization in the keeping of records, it is fair to state that laboratory service in the surveyed cities is generally well developed.

PERSONNEL

Bureau director.—Forty-three of the 89 laboratories directly connected with health departments (including those doing county and State work as well) had full-time directors in 1923, while 33 employed directors on a part-time basis. In 13 cities the health officers supervised the work at first hand, in 4 cases having only part-time assistants. It should also be mentioned that in 6 cities the full-time directors, so called, had no assistants, while in 7 others the part-time directors were only laboratory employees.

The replies to the questionnaire concerning qualifications of personnel were not particularly enlightening. In Cleveland, where the position of director is under civil service, a degree of M. D., Ph. D., or D. P. H., or equivalent training, is required. In San Francisco a graduate physician with special training in bacteriology is required. In 15 cities directors have had from 10 to 32 years' experience in public-health laboratory work. It was stated that 11 of the full-time directors and 16 of the part-time directors are graduates in medicine, 1 of the former group also having a doctor of public health degree. One full-time director holds a degree of doctor of public health without a medical degree, 1 a Ph. D., and another a degree of doctor of veterinary medicine, the latter director (St. Joseph) assisting in the supervision of food and dairy inspection as a full-time employee of the health department, as was the case in Jacksonville, Oklahoma City, and Tulsa. In addition to their public-health laboratory duties, 10 directors were engaged in other types of laboratory work, usually in hospitals, while at least 4 were university instructors. Three (2 part-time) were engaged in communicable-disease work, and a fourth (Savannah) was assistant

⁷ Buffalo, Chicago, Denver, Hartford, New York, Providence, Rochester, St. Louis (largely chemical), and Tacoma.

health officer. Four part-time directors spend the remainder of their time in the practice of medicine, 1 of them being a pediatrician. The detailed situation concerning full or part time service, and salaries of full-time directors is set forth in the table given below:

TABLE I.—*Character of service and salaries of laboratory directors, 89 cities, 1923*

Cities of population ¹	Number cities with director			Salaries of full-time directors			
	Full time	Part time	Health officer	Mean	Median	Minimum	Maximum
Over 500,000.....	9	3	0	\$3,992	\$3,600	\$3,000	\$6,500
250,000 to 500,000.....	8	6	2	3,234	2,800	2,340	5,750
100,000 to 250,000.....	20	20	5	2,658	2,700	1,800	4,000
70,000 to 100,000.....	6	4	6	2,430	2,200	1,800	4,000
All cities.....	43	33	13	3,007	3,000	1,800	6,500

¹ The cities falling in the 4 groups are listed on pp. 29-35.

From Table I it may be seen that the salaries of laboratory directors varied, as might be expected, with size of city, the average salary of 43 full-time directors amounting to approximately \$3,000. This also happens to be the median salary, and was paid the directors in San Francisco, Minneapolis, Akron, New Haven, Norfolk, and Oklahoma City in 1923. The maximum salary was paid in New York, where so much pioneer work has been done, and the minimum in Flint, Tacoma, and Fort Wayne, where the directors were the only laboratory employees. It is interesting to note in this connection that in 40 cities in 1920 the salaries of full-time chiefs of laboratory service ranged from \$1,500 to \$6,500, with a median of \$2,700. The average salaries for the groups of cities studied in that year, corresponding to the first three groups above, were \$4,016, \$2,665, and \$2,496. The salaries of part-time directors in 1923 ranged from \$900 to \$3,600, with an average of \$1,967 and a median of \$1,800.

Other personnel.—Unfortunately the information secured concerning personnel other than the directors is inadequate for satisfactory classification purposes, as only the total number rather than the types of laboratory workers was given in many cases. These data naturally show considerable variation, both with respect to size of city and among cities of approximately the same size but with diverse problems. In New York City, where the scope of work is extensive, including research and preparation of biological products, 23 bacteriologists, 62 assistants, and 82 laboratory helpers were employed. In several cities of less than 250,000 population,⁸ on the

⁸ Erie, Lawrence, Lowell, Manchester, New Bedford, San Diego, and Springfield, among others.

other hand, 1 or 2 part-time laboratory workers perform all examinations, both bacteriological and chemical. It is usually found that part-time service is somewhat expensive for the amount and type of work performed.

Five cities of Group I had from 15 to 46 workers in addition to the director, while the remaining 6 cities, exclusive of New York, had from 8 to 13. Five cities of Group II had from 5 to 9 workers, while 8 had from 1 to 4. Four cities of Group III had from 5 to 8 workers, while 23 others had from 1 to 4, besides 6 with part-time assistants and 8 with none. Five cities of Group IV employed from 1 to 3 full-time workers, while 5 others had 1 or 2 part-time assistants, and 5 had none. For the remaining 8 cities having local laboratories, exclusive of the contract laboratories, information on this subject was incomplete or entirely lacking. It should be mentioned in passing that the total personnel given in many cases apparently included clerical as well as technical employees. The most frequent need mentioned by health officers in connection with the laboratory situation in different cities was for an adequate staff of trained personnel. In formulating an opinion on the necessary technical staff for public-health laboratories as shown by practical experience, further classification is obviously desirable.

Information as to types of full-time laboratory personnel was fairly complete for 17 cities, 3 of Group I, 6 each of Groups II and III, and 2 of Group IV. These data show that 1 bacteriologist is employed per 193,000 population, 1 technician or assistant per 128,000 population, and 1 laboratory helper (exclusive of stenographer) for approximately 120,000 population. In 4 of these cities a relatively large number of chemical examinations were also performed, either in a separate laboratory or in a joint chemical and bacteriological laboratory. An average of 1 chemist per 264,000 population was employed in these 4 cities, which were the only ones of the 17, thus showing a special classification for chemists. In these 4 cities it may be noted that an average of 1 bacteriologist per 205,000 people was employed.

As these 17 laboratories were staffed by full-time employees, and as their general scope of work is fairly comparable, it is instructive to note that an average of 3,187 total examinations per laboratory worker were performed during the year 1923. These numbers varied from 1,818 in a laboratory where extensive research was carried on to 14,165 where relatively little research was undertaken, the median being 4,631. The volume of work performed will be discussed later, but it is noteworthy in this connection to observe that the service rendered by 12 of these 17 laboratories organized on a full-time basis was more extensive than the average, as indicated

by the total examinations per 1,000 population, the average for the selected cities being 98.9 (70.6 diagnostic) as compared with 78.5 for the surveyed cities as a whole.

CHARACTER OF SERVICE

In general, it may be stated that the effectiveness of laboratory work in a community may best be determined by a study of the scope and volume of work performed.⁹ These factors vary considerably in different cities, and obviously depend upon local conditions. For example, the presence of a well-organized State, hospital, or private laboratory will often tend to limit the scope of work which would otherwise be performed in a city public-health laboratory. It has been previously stated that 4 city health departments did not establish a laboratory until 1923 or 1924.

As nearly as can be ascertained, the following enumeration represents the scope of work performed in the other 96 cities. Bacteriological examinations of water were made in 71 cities, chemical in only 30; bacteriological examinations of milk were made in 84 cities, chemical in 66; examinations of food (including ice cream and, in a few cases shellfish) were made in 28 laboratories; drugs in 20; beverages for alcoholic content in 14; urine in 60. Examinations for diphtheria were made in 94 cities (virulence tests in 15), tuberculosis in 93 (complement fixation in 3), gonorrhea in 82 (complement fixation in 6), typhoid in 81, syphilis in 61 (dark field in 20), malaria in 43, rabies in 42, meningitis in 8, and plague in 4. The Widal method for typhoid confirmation was used in routine, but 41 laboratories also made blood cultures, or examinations of stools or urine, either one or all. The practice of requiring negative specimens of stools and urine before the release of typhoid patients has apparently become more common since the 1920 survey.

In addition to the examinations ordinarily made, pathological tissues were examined in 18 city laboratories, pneumococcus typing was done in at least 15, blood counts were made in 8, mothers' milk was examined in 5, swimming-pool water in 4, and sewage in 2.

In order to gain a more complete picture of the relative emphasis given to different types of work, the data for 25 cities having a well-rounded service were further classified with the following results: Of the total examinations made, those for diphtheria amounted to 43 per cent on the average, for syphilis 16 per cent, for gonorrhea 9 per cent, for tuberculosis 6 per cent, for typhoid 2 per cent, while milk examinations numbered 15 per cent, and water examinations 2 per cent of the total, leaving 7 per cent as miscellaneous specimens.

⁹ The administrative features and scope of work of the public-health laboratories in Birmingham, Ala., and in Bridgeport, Conn., have been described in an instructive manner in the A. J. P. H., March, 1924, and The Nation's Health, Dec. 15, 1923, respectively.

As in 1920, it should be noted that a very few of the largest city laboratories, notably New York, manufactured biological products for diagnosis, prevention, and treatment of diseases. Practically all the other laboratories served as distributing agents for such supplies (at least diphtheria antitoxin and smallpox vaccine) obtained from State laboratories, from the New York City laboratory, or by direct purchase from commercial concerns. It was stated that in 21 laboratories vaccines were prepared, but in all but 7 this was only upon special request for autogenous vaccines.

RESEARCH WORK

Research work was carried on in 21 of the 89 municipal laboratories (exclusive of contract laboratories). The character of this work varies widely with the different cities, as shown by the following broad classification of some of the most important investigations under way in 1923.

1. *Diphtheria*.—Special studies of diphtheria carriers and of technique used in diphtheria examinations were made in Baltimore, Toledo, and New Haven. Schick test and immunization studies were continued in New York and Denver.

2. *Scarlet Fever*.—Studies in the etiology of scarlet fever were carried on in New York, Detroit, and Columbus.

3. *Tuberculosis*.—The complement fixation test was further studied in Boston. Other tuberculosis studies were reported from New York, Chicago, Los Angeles, Milwaukee, and St. Paul laboratories.

4. *Typhoid*.—Methods for laboratory diagnosis of typhoid fever received consideration in Los Angeles, Richmond, and St. Paul.

5. *Milk*.—Research studies of a wide variety were pursued in Baltimore, Chicago, Cleveland, Detroit, and New Haven.

6. *Miscellaneous*.—In addition to the above-mentioned types of investigations, many other problems have been studied. These include work on food poisoning in Milwaukee, New York, and Washington; Brills' disease in Savannah; protozoology problems, among others, in Buffalo; trade wastes in Cleveland; antirabic vaccination in Newark; and vitamins in Spokane. Jersey City, Providence, and Rochester were also included in the list of cities in which research problems were said to be under way during this year. In addition, New York conducted research on pneumonia sera, measles serum, anthrax, the use of brilliant green dye in the sterilization of vaccine, rat fleas, a classification of the paratyphoid group of organisms, and a study of the Wassermann test.

It is somewhat disconcerting to find that only 21 of the cities of this study reported through the surveyors that special investigations were being undertaken in the public-health laboratories, when of

the smaller group of 83 cities of 1920, 27 reported that definite research work was being pursued. Whether or not the year 1923 was a period of lag it is impossible to ascertain, but this seems unlikely. Surely since that time many important studies have been reported from different cities included in this survey. Reports from several cities suggested that the value of special investigations was realized, but that staff and funds were entirely inadequate for any but routine observations. This is added proof of the need for education in developing sympathetic public opinion. It seems well to emphasize repeatedly that a laboratory, if adequately staffed and equipped, is in a position to render important service to its community, as well as to the country as a whole, through its research studies of practical problems.

GENERAL PROCEDURE AND EQUIPMENT

In all cases, as in 1920, it was reported that examinations for city health work are made free. A few of the laboratories perform examinations for persons outside of the city, for which they receive fees. The equipment of the laboratories, including contract laboratories, was listed as adequate or sufficient for the present needs in 65 cases, fair in 12 cases, and limited or inadequate in seven cases. Information on this question is lacking concerning the other laboratories. Several laboratories are now supplied with the leading public-health and medical journals and also give members of their staff an opportunity to attend conventions and visit other laboratories where new methods are being developed.

The majority of laboratories are centrally located in quarters ample for existing needs, although several have no room for expansion and a few are very crowded. The number of square feet of space allotted to the laboratories of cities of 500,000 and over ranged from 1,013 in Los Angeles and 2,900 in Boston to 56,232 in New York. In cities of 250,000 to 500,000, 850 (Portland) to 7,200 (Newark) square feet were utilized for this purpose. In cities of less than 250,000 population the majority of cities provided from 500 to 1,500 square feet for this work.

The larger cities and many of the smaller ones maintained culture stations, chiefly for the convenience of physicians who desire to leave specimens late in the day, and as distributing centers for fresh media and outfits. In the larger cities they are also useful for physicians in districts far removed from the laboratory. Collections are generally made once a day, either by members of the laboratory force or by sanitary inspectors. It is noteworthy that the attitude of local physicians toward the laboratory was reported by the health officers as "favorable," "friendly," or "cooperative,"

in practically every city of this study. This fact was frequently borne out in the analysis of the volume of work performed by the various laboratories. Nearly one-third of the laboratories reported efforts to increase the use of this service in the city through the distribution of circulars or other publicity and special talks to medical men as well as by prompt and efficient service. At least four others indicated that facilities were already taxed by the volume of work performed. The remaining laboratories were evidently satisfied with the existing situation.

Records of examinations are quite generally maintained, usually on file, in the laboratory. The reports from four cities suggest particularly the use of a daybook and six others the use of a card index. It is apparent from the classification of types and numbers of examinations made that there is need for a definition of what constitutes a laboratory "examination" and a laboratory "specimen," followed by some stimulus for uniform bookkeeping in the different laboratories.

VOLUME OF WORK

Health officials now recognize the laboratory as the foundation of effective health work and as a means for coordinating their activities. Around public-health laboratories centers much of the practice of modern medicine. While there are many limitations to the use of "number of examinations per 1,000 population," this calculation is of some value in measuring the volume of work performed. It is interesting to note in Table II that data for 78 cities show that 78 examinations were performed per 1,000 population; 60 of these, or 77 per cent, were examinations of a diagnostic character. This free service tends to make friends for the health department among physicians and the public.

The data for 64 cities of 100,000 population and over in 1920 showed that 85 examinations were performed per 1,000 population; 63 of these, or 74 per cent, were of a diagnostic character.

According to the 1923 figures, 25 cities report less than 50 examinations (of all kinds) per 1,000 population; 32 cities from 50 to 100; 15 cities from 100 to 150; and 6 cities above 150.

In seeking other means of measuring the effectiveness of laboratory service for the cities of 100,000 population and over, there were secured the cases of diphtheria and of typhoid fever reported in 1923 for comparison with the diagnostic laboratory examinations made. In 58 of the cities of this study an average of 19 laboratory examinations of diphtheria cultures were made for every case reported. For 52 cities it is also interesting to find that an average of 7.3 typhoid examinations (Widal and culture combined) were made for each case reported during the year. It is customary to consider a positive find-

ing of diphtheria or typhoid in a specimen for diagnosis as a positive case report, since the physician frequently awaits the laboratory report before making his final diagnosis.

TABLE II.—Number and cost of public-health laboratory examinations, 1923

Cities of population	Number of cities	Number of examinations				Cost	
		Per 1,000 population		Per case reported		Per capita	Per examination
		Total	Diagnostic	Diphtheria	Typhoid		
Over 500,000.....	11	77	59	17.9	6.8	\$0.04	\$0.59
250,000 to 500,000.....	12	90	70	26.9	12.0	.03	.36
100,000 to 250,000.....	37	78	52	¹ 16.7	² 4.8	.03	.41
70,000 to 100,000.....	18	69	46			.04	.59
All cities.....	78	78	60	19.0	7.3	.04	.51

¹ 29 cities.

² 35 cities.

COST OF LABORATORY OPERATIONS

The cost of these laboratory operations for the 78 cities was 4 cents per capita; the average for 11 cities of Group I was 4 cents; for the 12 cities of Group II, 3 cents; for 37 cities of Group III, 3 cents; and for 18 cities of Group IV, 4 cents. This agrees with the average per capita cost reported for 43 cities in 1920.

In computing the cost per specimen it should be remembered that some types of examinations are more expensive than others. In 11 of the cities of Group I, 8 of whom carry on research, the cost per examination was 59 cents; in 12 cities of Group II the cost was 36 cents; in 37 cities of Group III the cost was 41 cents; and in 18 cities of Group IV the cost was 59 cents. The average cost per examination was 51 cents, as compared with 40 cents reported for 43 cities in 1920. It has obviously been found impossible to consider research costs in these determinations because of lack of precise data.

SUMMARY AND CONCLUSIONS

1. Public-health laboratory service is well developed in the majority of the 100 largest cities of the United States. At the time of the survey four cities were dependent upon the State for free diagnostic service. Since that time one of these has established its own laboratory.
2. The scope of laboratory operations is apparently more uniform than the methods of record keeping. This situation is doubtless the result of lack of definition of what constitutes a laboratory examination. It might be well to consider the desirability of recording both

the number of specimens received and the number of examinations of each kind performed.

3. The importance of research is generally recognized by laboratory directors, but in nearly 80 per cent of the laboratories special studies of this character can not be undertaken because of lack of adequate funds and a sufficient corps of trained workers.

4. In an outline of the personnel needed to carry out a comprehensive laboratory program in a city of 100,000 population it was suggested in the previous report of the Committee on Municipal Health Department Practice in 1923 that a staff of one bacteriologist, a chemical assistant, a helper, and a clerk is necessary. A fairly detailed analysis of the personnel and scope of work of a selected group of laboratories previously mentioned indicates that this is a reasonable and desirable organization, both as to type and number of laboratory workers.

5. The average number of examinations performed in 78 cities was 78 per 1,000 population, 77 per cent being of a diagnostic character. A study of the work of several first-class laboratories indicates, however, that from 100 to 125 examinations per 1,000 population may be expected from such a laboratory, organized on a full-time basis, except in a few cases where extensive research problems are under investigation.

6. The cost of laboratory examinations, exclusive of research, varies considerably, but averages 51 cents. The cost per capita for laboratory services ranges from less than 1 cent to 13 cents, but averages 4 cents. Under present conditions from 4 to 9 cents per capita are needed in most cities for the maintenance of a first-class public-health laboratory, providing for research as well as for a wide range of bacteriological and chemical examinations.

7. The attitude of local physicians toward the laboratory is reported as favorable or cooperative in most cases. Prompt and efficient service is frequently given by directors as the chief method of securing a fuller use of laboratory service.

XIV. MILK CONTROL

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In the following analysis of the milk-control data of 100 of the larger American cities, based upon the survey for 1923, the material has been subdivided into the following major classifications: (1) Extent of State control, (2) Organization, (3) Personnel, (4) Cost of control, (5) Production, (6) Pasteurization, (7) Distribution, (8) Quality, (9) Consumption, and (10) Program for municipal milk control.

1. EXTENT OF STATE CONTROL

TABLE I.—*Extent of State control*

Extent of control specified	Number of cities reporting				
	Popula- tion Group I	Popula- tion Group II	Popula- tion Group III	Popula- tion Group IV	All cities
No State control.....	3	10	18	9	40
Limited control.....	9	6	32	13	60
Complete control.....	0	0	0	0	0
Control limited to Pasteurized milk.....	1	0	3	2	6
Control limited to adulteration.....	0	0	1	0	1
Control limited to tuberculin testing.....	1	0	0	2	3

It is evident from the above table that in all of the 100 cities there is either limited or no State control. This statement seems to be true of all population groups. The replies to this part of the questionnaire did not permit much detailed analysis. Many of the replies were such as the following: "Occasional," "limited," "cooperates with city," "general supervision," etc.

2. ORGANIZATION

Comparatively few health departments separate milk control from other functions, only 10 cities reporting an organized bureau or division of milk and dairy control functioning under a chief of division. In the majority of cities milk control is combined either with food inspection alone or with food inspection and other activities. Table II shows in greater detail how milk control was organized in 1923.

TABLE II.—*Number of cities having separate milk-control organizations, and number in which milk control is combined with various other activities of the health department, 1923*

Population group	Num-ber of cities	Milk control separate		Milk control combined with—						
		Organ-ized as a bu-reau or division	Not organ-ized	Food	Food and drugs	Food and sani-tation	Food and labo-ratory	Meat	Labo-ratory	Sani-tation
I.....	12	1	1	7	1	-----	-----	1	1	-----
II.....	16	2	-----	8	3	1	-----	-----	-----	2
III.....	50	7	8	17	1	5	1	3	6	2
IV.....	22	-----	8	8	1	-----	1	2	1	1
Total.....	100	10	17	40	6	6	2	6	8	5

The separation of milk control from other health-department activities is more common in the smaller cities than in the larger ones. This surprising condition is largely due to the fact that in many of the smaller cities the various inspectors work more or less independently of each other and report only to the health officer.

A separate bureau or division of milk control was reported for the following cities: Group I, Los Angeles; Group II, Denver, Portland; Group III, Bridgeport, Cambridge,¹ Duluth, Fort Worth, Kansas City (Kans.), Lowell, Providence.

Milk control, while separated from other functions, is not organized as a bureau or division of the health department in the following cities: Group I, San Francisco (under chief food inspector); Group III, Albany, Des Moines, Norfolk, San Antonio, Tacoma, Trenton, Wilmington, Worcester; Group IV, Evansville, Fort Wayne, Lawrence, Manchester, Peoria, Savannah, Somerville,¹ Troy.

There is no evidence at hand to indicate any superiority of separate milk control over a combination of this activity with other allied functions such as food and sanitary inspection.

3. PERSONNEL

Table III shows the number and per cent of cities having a whole-time director or chief in charge of milk control; also the average number of whole-time and part-time veterinarians, inspectors, and other personnel engaged in milk control per 100,000 population, by population groups, for the 98 cities for which this information is available.

¹ Milk and vinegar.

TABLE III.—Personnel engaged in milk control, 1923

[Note: P. T. designates part-time employees as well as whole-time employees devoting only part time to milk]

Population group	Num-ber of cities	Population	Director or chief (whole time)		Average number of personnel per 100,000 population ¹							
					Veterina-rians		Inspectors		Others ²		Total	
			Num-ber	Per cent	W. T.	P. T.	W. T.	P. T.	W. T.	P. T.	W. T.	P. T.
I ³ -----	11	11, 412, 543	1	9.1	0.12	0.02	1.06	0.36	0.07	0.07	1.26	0.54
II ⁴ -----	15	5, 331, 467	2	13.3	.02	.24	1.14	.04	.17	.38	1.37	.88
III-----	50	7, 310, 265	13	26.0	.07	.08	.88	.30	.16	.12	1.29	1.01
IV-----	22	1, 915, 525	1	4.5	.10	.10	.52	.68	.05	-----	.73	1.90
All-----	98	25, 969, 800	17	17.3	.09	.08	.97	.33	.11	.14	1.23	.86

¹ Director or chief not included except in total.

² Sample collectors, clerical and laboratory personnel.

³ Excluding New York.

⁴ Excluding Louisville.

Few cities have a whole-time director or chief of dairy and milk control, due to the scarcity of separate divisions for milk control. Where this activity is carried on in conjunction with others, the director or chief may be a whole-time employee, but necessarily devotes only part of his time to milk. Group III had the highest percentage of cities with whole-time directors.

Cities of Group I employed for milk control the largest number of whole-time veterinarians in proportion to population, and those of Group II the lowest, while Groups I and II employed the largest number of whole-time inspectors assigned exclusively to milk control. As regards total employees (including director or chief) devoting whole time to milk control there is a surprising uniformity in all groups except that containing the smallest cities, which is much lower than the others in proportion to population, but which, on the other hand, has the largest number of employees devoting part time to milk control.

TABLE IV.—Professional training of person in charge of milk control

Profession specified	Number of cities reporting—				
	Popula-tion Group I	Popula-tion Group II	Popula-tion Group III	Popula-tion Group IV	All cities
Physicians-----	1	3	13	9	26
Veterinarians-----	2	3	7	5	17
Engineers-----	0	1	0	0	1
Chemists-----	1	0	2	1	4
Bacteriologists-----	0	0	2	1	3
No profession or not reported-----	8	9	26	6	49
Total number of cities-----	12	16	50	22	100

Table IV indicates the variety of professions in charge of milk-control work. Forty-nine of the 100 cities employed men whose profession is not given in the report. It is impossible to know how many of these have no professional training, but if the remainder of the cities be considered as a criterion it is apparent that, except for physicians (who hold first place largely because in so many of the cities the milk-inspection work is reported as coming directly under the health officer), veterinarians are most frequently employed. This statement holds true for all of the city groups. It does not necessarily mean that veterinarians are naturally best equipped to direct milk-control work. Many of the men under the "no profession or not reported" group are probably graduates of agricultural colleges and possibly equally well fitted to supervise municipal milk control.

4. COST OF CONTROL

Since salaries constitute, on the average, over 80 per cent of the total expenditures for milk control, it is of interest to note what salaries are paid to the personnel engaged in this work. Part-time men can not be readily compared, as their salaries depend largely on the amount of time devoted to their work. The following table shows the maximum, minimum, and average salaries paid veterinarians and inspectors devoting whole time to milk control, by population groups, in 60 cities for which salary rates are fully available.

TABLE V.—*Annual salaries of veterinarians and inspectors devoting whole time to milk control, 60 cities, 1923*

Population group	Num- ber of cities	Veterinarians				Inspectors			
		Num- ber	Maxi- mum salary	Mini- mum salary	Aver- age salary	Num- ber	Maxi- mum salary	Mini- mum salary	Aver- age salary
I.....	8	6	\$3,300	\$1,980	\$2,810	92	\$3,500	\$1,200	\$1,700
II.....	13	1	1,910	1,910	1,910	53	1,920	1,200	1,540
III.....	30	6	3,000	1,620	2,370	51	3,000	825	1,790
IV.....	9	2	2,400	2,220	2,310	9	2,750	1,100	1,690
Total.....	60	15	3,300	1,620	2,500	205	3,500	825	1,680

Cities of Group I pay higher salaries for veterinarians devoting whole time to milk control than the average for all cities. Average salaries paid inspectors devoting whole time to milk control vary only slightly among population groups.

The average total expenditures for milk control, per city and per capita, and the ratio of salaries to total expenditures are arranged in the following table by population groups, including 64 cities for which separate figures for milk control are available.

TABLE VI.—Average total expenditure by city health departments for milk control, 64 cities, 1923

Population group	Number of cities	Total population	Average annual expenditure		Per cent of total for salaries
			Per city	Per capita	
I.....	6	4, 287, 045	\$33, 060	<i>Cents</i> 4. 62	80
II.....	8	2, 498, 350	8, 980	2. 87	85
III.....	36	5, 469, 308	5, 230	3. 44	83
IV.....	14	1, 246, 221	2, 750	3. 10	87
Total.....	64	13, 500, 924	7, 760	3. 68	84

It will be seen that the average expenditure per city for milk control decreases as the population decreases, as would be expected. The average per capita expenditure is highest in Group I and lowest in Group II. Of the 64 cities included, those having, respectively, the maximum and the minimum per capita expenditure (in cents) for milk control are as follows: Group I, Boston, 5.9; San Francisco, 2.5; Group II, Portland, 6.0; Cincinnati, 1.6; Group III, Dallas, 6.8; Utica, 1.1; Group IV, El Paso, 5.7; Knoxville, 0.5.

5. PRODUCTION

Size of producing dairy farm.—It was not possible, from the material gathered in the survey, to determine the average amount of milk produced per producing dairy farm. The number of producing dairies and the daily milk consumption were included in the survey data, but it was impossible to derive from these figures the average production per dairy farm because production and consumption are frequently not identical. Often the “milk shed” about a given city produces considerably more milk than is consumed locally, the remainder being shipped to other communities.

An attempt was made, however, to derive a figure which would make it possible in future surveys to predict approximately the number of producing dairies supplying a given population, that is, the average population served per producing dairy in each of the city groups. These averages may be transformed into producing farms per 100,000 population. The results of these computations are given in Table VII.

TABLE VII.—Average population served per producing dairy, 89 cities, 1923

Population group	Number cities reporting	Average population served per producing dairy farm	Producing farms per 100,000 population
I.....	11	113	890
II.....	14	133	750
III.....	45	191	523
IV.....	19	165	607
All.....	89	130	768

In general, for the cities in the 1923 survey there is a decrease in the number of producing farms per 100,000 population as the size of the community decreases. For cities having less than 70,000 population the number of producing dairies per 100,000 population is usually less than 500. This decrease in number of producing dairies per 100,000 population as the size the community decreases indicates that smaller communities have on an average larger producing dairies. This is probably due to the fact that in smaller cities less of the milk is Pasteurized. Farms which retail raw milk are usually more exclusively devoted to milk production than farms which deliver milk to Pasteurization plants; in other words, milk is more apt to be their principal business, and hence the average production tends to be greater.

Tuberculin testing of cows.—Table VIII gives the average percentage of cows reported to have been tuberculin tested and the average percentage of reactors found in each of the four groups of cities.

TABLE VIII.—Tuberculin testing as reported for 67 cities, 1923

Population group	Percentage tested		Percentage reactors	
	Number of cities reporting	Per cent tested	Number of cities reporting	Per cent reactors
I.....	6	44.7	5	5.4
II.....	15	49.0	12	4.3
III.....	34	68.8	28	8.3
IV.....	12	71.6	11	9.5
All groups.....	67	62.6	56	7.4

It will be observed that the percentage of cows tuberculin tested increases as the size of the community decreases, which is probably related to the relatively lower percentage of milk pasteurized in the smaller cities. It is a general practice to place more emphasis

upon tuberculin testing in the case of milk sold raw than in the case of milk that is Pasteurized.

The percentage of cows reported to have been tuberculin tested in the very large cities is, however, unexpectedly high, the average percentage of cows tuberculin tested in cities of over 500,000 population being nearly 45 per cent, while the average percentage of milk pasteurized in these cities is 97.1 per cent. This surprising and gratifying amount of tuberculin testing among herds whose milk is to be Pasteurized possibly foreshadows an increasing future tendency to support the Pasteurization process with a greater emphasis upon pre-Pasteurization sanitation.

Twenty-six of the 100 cities surveyed reported (for 1923) that all the cows supplying them with milk were tuberculin tested, namely, San Francisco and St. Louis in Group I; Kansas City, Mo., New Orleans, and Washington in Group II; Atlanta, Birmingham, Dallas, Duluth, Houston, Jacksonville, Kansas City, Kans., Nashville, Norfolk, Oakland, Oklahoma City, Omaha, Salt Lake City, Scranton, and Worcester in Group III; El Paso, Fort Wayne, St. Joseph, San Diego, Savannah, and Wichita in Group IV.

The average percentage of reactors found appears to increase as the average size of community decreases. These figures should be used with caution, however, as the survey made no distinction between cities which had recently begun tuberculin testing and cities which had been carrying on the work for a number of years. In the latter cities, of course, the percentage of reactors found has decreased as a result of the work itself. It is possible that the relatively higher percentage of reactors found in the smaller cities indicates a more recent attack upon the problem.

Cities reporting high percentages of reactors were Detroit, with 12 per cent; Rochester, 15 per cent; Albany, 12 per cent; Bridgeport, 15 per cent; Fall River, 17 per cent; Hartford, 40 per cent; New Haven, 40 per cent; Reading, 20 per cent; Syracuse, 13 per cent; Worcester, 12 per cent; Allentown, 30 per cent; and Waterbury, 48 per cent.

Cities reporting very low percentages of reactors were Atlanta, with 0.5 per cent; Dallas, 0.004 per cent; Duluth, 0.8 per cent; Nashville, 0.1 per cent; Memphis, 0.4 per cent; Oklahoma City, 0.5 per cent; El Paso, 0.5 per cent; and Knoxville, 0.3 per cent.

It was noted that in all of these cities with very low percentages of reactors the percentage of cows reported as tuberculin tested was over 95 per cent with the exception of Knoxville, for which this information was not given. It is not possible to state definitely that these two facts are related. It may be merely the result of the fact that complete testing of all herds meets with less objection where

the percentage of reactors is low. On the other hand, it is more than possible that the low percentage of reactors was at least partly the result of complete testing over a term of years.

TABLE IX.—*Agency by whom tuberculin tests were made, 1923*

Agency specified	Number of cities reporting				
	Popula- tion Group I	Popula- tion Group II	Popula- tion Group III	Popula- tion Group IV	All cities
City, State, and Federal authorities.....	0	2	0	0	2
State and Federal authorities.....	3	3	15	5	26
State authorities.....	3	1	8	5	17
City and State authorities.....	1	0	0	0	1
County and State authorities.....	0	0	0	1	1
City authorities.....	0	1	2	0	3
Private veterinarians.....	3	6	17	4	30
Unsatisfactory or miscellaneous replies.....	2	3	8	7	20
Total cities reporting.....	12	16	50	22	100

It is evident from Table IX that there is no material difference in the practices of the various population groups with respect to the agency by whom tuberculin tests are made. The largest percentage of the cities reporting any one practice is 30 per cent, these 30 cities reporting that the testing was done by private veterinarians. The next largest group of cities (26) reported that the testing was done by State and Federal authorities. Seventeen per cent of the cities had the work done by State authorities alone. Only three of the cities did their own independent testing through city veterinarians.

TABLE X.—*Frequency of tuberculin testing, 89 cities, 1923*

Frequency specified	Number of cities reporting				
	Popula- tion Group I	Popula- tion Group II	Popula- tion Group III	Popula- tion Group IV	All cities
Biennial.....	0	0	1	0	1
Annual.....	4	14	35	14	67
Biannual.....	4	1	6	5	16
Irregular intervals.....	0	0	5	0	5
Total cities reporting.....	8	15	47	19	89

It is evident from Table X that the vast majority of the cities, irrespective of population group, required annual rather than biennial or semiannual testing. A number of cities required retesting within six months of all herds in which reactors were found as a result of the annual testing, but neither this fact nor the extent of the practice is evident from the questionnaire.

TABLE XI.—Disposition of reactors

Method of disposal specified	Number of cities reporting				
	Popula- tion Group I	Popula- tion Group II	Popula- tion Group III	Popula- tion Group IV	All cities
"Slaughtering and destruction"-----	0	2	3	2	7
"Slaughtering"-----	7	13	36	16	72
"Removal from farm"-----	2	1	3	0	6
No action-----	3	0	8	4	15
Total cities-----	12	16	50	22	100

Table XI indicates that, irrespective of population group, disposition of reactors was usually made by "slaughtering," 72 per cent of the cities reporting this action. "Slaughtering and destruction" was reported by only 7 per cent of the cities.

Physical examination of employees.—The number and percentage of cities reporting that a physical examination of employees on producing dairy farms was required are given for each of the various groups in Table XII. Fourteen other cities required such an examination only for select grades of milk.

TABLE XII.—Physical examinations of persons engaged in the production of milk, 14 cities, 1923

Group	Cities reporting physical examinations of employees on dairy farms	
	Number	Per cent
I-----	0	0
II-----	1	6
III-----	9	18
IV-----	4	18
All cities-----	14	14

The smaller cities apparently placed more emphasis upon health examination of dairy-farm employees than did the larger cities. Only 1 of the 28 cities over 250,000 population reported making physical examinations of dairy-farm employees, while, on the other hand, 13 of the 72 smaller cities required this examination.

The inquiry as to the chief objective to be gained by these examinations elicited rather unsatisfactory replies. One of the more frequent objectives given was "freedom from communicable diseases." Only two cities reported the use of laboratory tests in connection with the examinations, and in no report was any specific reference made to

laboratory tests for the detection of typhoid carriers. A more intensive study is necessary in order to interpret the present practice as to physical examinations of milk handlers.

Sterilization of utensils.—Table XIII gives the methods of sterilization of dairy-farm utensils reported by the cities in the various groups.

TABLE XIII.—*Methods of sterilization of utensils reported by 78 cities, 1923*

City group	Cities reporting some method of sterilization		Method of sterilization					
			Steam only		Hot water permitted		Chemicals permitted	
	Number of cities	Per cent	Number of cities	Per cent	Number of cities	Per cent	Number of cities	Per cent
I.....	8	67	2	17	5	42	2	17
II.....	10	62	4	25	5	31	1	6
III.....	41	82	13	26	22	44	10	20
IV.....	19	86	5	23	13	59	2	9
All groups.....	78	78	24	24	45	45	15	15

It will be noted that only about 24 per cent of the cities reported the use of steam as the essential means of sterilization in use at dairy farms. Forty-five per cent permitted the use of boiling water and 15 per cent permitted the use of chemicals. Such a summary of the practice in respect to sterilization of utensils used on dairy farms may be misleading in the absence of more definite information as to the probable adequacy of the methods in use and the measures taken to insure their routine performance.

In general, cities under 250,000 population appear to be more concerned with farm-utensil sterilization than the larger cities, about 83 per cent of the smaller cities reporting some requirement as to sterilization as compared with about 64 per cent of the larger cities. This is probably again related to the fact that the percentage of milk Pasteurized is greater in the larger cities than in the smaller.

It is significant, however, that 67 per cent of the larger cities report sterilization by either steam, hot water, or chemicals at the dairy farm, even though 96 per cent of the milk in these cities is Pasteurized. Here, again, as in the case of tuberculin testing, there is evidence of a tendency to require farm sanitation despite the use of Pasteurization. The percentage of cities reporting some form of farm-utensil sterilization in the smallest group of cities is 86.

Cooling.—The cooling requirements at the farm for the various groups of cities are shown in Table XIV.

TABLE XIV.—*Temperature requirements at the farm, 1923*

Temperature requirements specified	Number of cities reporting—				
	Popula- tion Group I	Popula- tion Group II	Popula- tion Group III	Popula- tion Group IV	All cities
48° F. or below for all milk.....	0	0	0	1	1
50° F. or below for all milk.....	1	9	25	9	44
54° F. or below for all milk.....	0	0	1	0	1
55° F. or below for all milk.....	3	0	4	3	10
60° F. or below for all milk.....	3	4	9	5	21
64° F. or below for all milk.....	1	0	0	0	1
65° F. or below for all milk.....	0	0	3	1	4
70° F. or below for all milk.....	1	0	0	1	2
50° F. or below for select grades.....	1	0	0	0	1
55° F. or below for select grades.....	0	0	1	0	1
Unsatisfactory reports.....	0	0	3	2	5
No temperature requirements.....	2	3	4	0	9
Total cities reporting.....	12	16	50	22	100

Evidently the most usual practice of the cities of Groups II, III, and IV is to require a cooling temperature of 50° F. or less at the dairy farm, whereas only one of the 12 cities of Group I makes this requirement. In Group I, however, 7 of the 12 cities require that the milk at the farm must be cooled to 60° F. or lower. Seventy-seven cities reported temperature limits of 60° F. or less at the farm, while only two of the cities reported special requirements for select grades.

A note of caution is advisable here. The figures in Table XIV refer to *requirement*, but they do not indicate *performance*. The data collected did not warrant any conclusion as to the degree to which any specified requirement was carried out by the dairy industry.

Inspection interval.—Table XV gives in days the average interval between inspections of dairy farms as reported by the various city groups.

TABLE XV.—*Frequency of dairy farm inspection, 1923*

Population group	Average interval between inspec- tion in days
I.....	177
II.....	138
III.....	160
IV.....	184
All groups.....	168

In general, it may be stated that the average practice reported in 1923 was to inspect dairy farms a little oftener than twice each year, obviously insufficient for adequate control. The cities which

report inspecting their producers most frequently are: Group I, Los Angeles and Pittsburgh, which inspect at intervals of 38 and 24 days, respectively; Group II, Kansas City, Mo., and Seattle, 65 and 58 days, respectively; Group III, Memphis, Norfolk, Paterson, and Richmond, 40, 20, 31, and 29 days, respectively; Group IV, Savannah, with an inspection interval of 42 days.

Producers' permits.—Producers' permits are required in 45 cities. There appears to be a tendency for the larger cities to be less concerned in the requirement of producers' permits.

6. PASTEURIZATION

TABLE XVII.—*Temperature and time requirements for Pasteurization*

Requirements specified	Number of cities reporting				
	Popula- tion Group I	Popula- tion Group II	Popula- tion Group III	Popula- tion Group IV	All cities
140° F.: 20 minutes.....	0	0	0	1	1
140° F.: 30 minutes.....	2	0	9	2	13
140° F.: 40 minutes.....	0	0	0	1	1
142° F.: 20 minutes.....	0	0	1	0	1
142° F.: 30 minutes.....	8	5	17	10	40
143° F.: 30 minutes.....	0	1	2	0	3
145° F.: 20 minutes.....	0	2	3	0	5
145° F.: 30 minutes.....	2	8	18	8	36
All temperatures for—					
20 minutes.....	0	2	4	1	7
30 minutes.....	12	14	46	20	92
40 minutes.....	0	0	0	1	1
All holding periods at—					
140° F.....	2	0	9	4	15
142° F.....	8	5	18	10	41
143° F.....	0	1	2	0	3
145° F.....	2	10	21	8	41
Number cities reporting.....	12	16	50	22	100

From the summary of temperature and time requirements for Pasteurization presented in Table XVII it is evident that 142° F. for 30 minutes is more frequently required than any other combination, 40 per cent of the cities reporting these specifications. The next most favored combination is 145° F. for 30 minutes, which is required by 36 per cent of the cities.

Considered by population groups, the two middle-sized groups (II and III), lean very slightly more toward 145° F. for 30 minutes than toward 142° F. for 30 minutes; 39 per cent of the cities in these two groups favor the former while 33 per cent favor the latter. On the other hand, the larger cities of Group I and the smaller cities of Group IV show a tendency to require 142° F. for 30 minutes; 67 per cent of the former and 45 per cent of the latter requiring this combination, as compared with 17 and 36 per cent, respectively, requiring 145° F. for 30 minutes.

Irrespective of the temperature specified, the great majority of the cities in all groups (92 per cent) require a holding period of 30 minutes, while with varying holding periods the percentage of cities requiring 145° F. is exactly equal to the percentage requiring 142°; namely, 41 per cent. The cities of Groups II and III specify 145° F. more frequently than any other temperature, whereas the cities of Groups I and IV appear to favor 142° F.

Extent of use of recording thermometers.—All cities in Group I, all but one city in Group II, all but four cities in Group III, and all but three cities in Group IV report the use of recording thermometers at the Pasteurization plants supplying these cities.

Physical examination of employees.—The number of cities that reported the requirement of physical examination of employees at Pasteurization plants is given in Table XVIII, which includes also all persons engaged in the distribution of milk.

TABLE XVIII.—*Physical examinations of persons engaged in the preparation and distribution of milk, 39 cities, 1923*

Population group	Cities requiring physical examinations	
	Number of cities	Per cent of total
I.....	5	42
II.....	4	25
III.....	22	44
IV.....	8	36
All cities.....	39	39

Evidently a much larger percentage of cities require physical examinations of employees engaged in Pasteurization and distribution than of dairy-farm employees. (See Table XII.) Only 14 per cent of the cities reported that physical examinations of farm employees were required, whereas 39 per cent, or almost three times as many cities, reported the examination of employees engaged in Pasteurization and distribution. Nevertheless, the percentage of cities failing to make examinations of Pasteurization-plant employees is large (61 per cent), and more attention should be paid to this phase of milk sanitation.

The character and frequency of the examinations required and further information as to the persons responsible for the conduct of these examinations or the action taken upon evidences of disease were not usually recorded. In some cities these examinations are made by some member of the medical staff of the health department while in others a certificate of the private physician employed by the person examined is accepted.

Frequency of plant inspections.—Table XIX gives the frequency of inspection of Pasteurization plants reported by the four groups of cities.

TABLE XIX.—*Reported frequency of plant inspection, 84 cities, 1923*

Frequency of inspection	Number of cities reporting				
	Popula- tion Group I	Popula- tion Group II	Popula- tion Group III	Popula- tion Group IV	All cities
Daily.....	2	2	2	1	7
Every 2 to 7 days.....	6	5	22	9	42
Every 8 to 15 days.....	2	4	5	3	14
Every 16 to 30 days.....	1	2	6	5	14
Every 31 to 60 days.....	0	0	2	0	2
Over 60 days.....	0	2	3	0	5
Total cities reporting.....	11	15	40	18	84

For Pasteurization plants, an inspection interval of from 2 to 7 days was far more frequently reported than any other, 50 per cent of the cities reporting this interval. The following cities reported daily inspections: Los Angeles and San Francisco in Group I; Kansas City, Mo., and Milwaukee in Group II; Birmingham and Fort Worth in Group III; and Bayonne in Group IV.

Methods of sterilization in use.—From the reports received during the present survey, the use of steam in the sterilization of utensils and apparatus used at Pasteurization plants, as well as for the distribution of milk, appears to have been the most common practice, 49 per cent of the 100 cities reporting its exclusive use. The use of steam and hot water was reported by 30 per cent of the cities surveyed, while only 13 per cent used chemicals in combination with steam or with steam and hot water. Two cities only specified that hypochlorite was used. It would be misleading to assume, on the basis of the distribution in Table XX, that chemicals and hot water are not used by dealers in those cities. As a matter of fact, the majority of the Pasteurization plants as well as the distributors probably make use of both hot water and chemicals in addition to steam, and most of the cities reporting steam and hot-water methods probably also use chemicals. The term "chemicals" as reported in the present survey frequently means a caustic alkali solution, used as a cleansing agent but accepted by many health officials as having bactericidal value.

In general Table XX should be interpreted, not as indicating the only agents permitted or used, but as indicating the agents *relied upon in the opinion of the health officer for effective sterilization*. There seems to be no significant variation as between population groups.

TABLE XX.—*Methods of sterilization in use at Pasteurization plants and for utensils used in the distribution of milk, 1923*

Methods in use	Number of cities reporting—				
	Popu- lation Group I	Popu- lation Group II	Popu- lation Group III	Popu- lation Group IV	All cities
Steam only.....	3	8	26	12	49
Hot water only.....	0	1	1	0	2
Steam and hot water.....	3	4	15	8	30
Steam and chemicals.....	2	1	3	1	7
Steam, hot water, and chemicals.....	2	1	2	1	6
Hypochlorite specified.....	1	0	1	0	2
Unclassified.....	2	1	3	0	6
Total cities reporting.....	12	16	50	22	100

Temperature requirements for milk in transit.—According to the data presented in Table XXI, 34 of the 100 cities required that milk in transit from the producer to the Pasteurization plants shall be maintained at a temperature not exceeding 50° F. Twenty cities had adopted 60° F. as the maximum temperature, this upper limit applying altogether to 63 cities. Maximum temperatures as high as 70° F. were reported by four cities. For 27 cities the reports were either unsatisfactory or indicated that no definite requirements were in force.

The extent to which these temperature requirements were generally enforced could not be determined from the information available. Some sort of an inspection service is necessary in order to maintain effective supervision over the temperature at which milk is held while in transit. One of the most satisfactory checks upon refrigeration methods is perhaps the record of temperatures taken at the time the milk reaches the Pasteurization plants.

TABLE XXI.—*Temperature requirements for milk in transit, 1923*

Temperature required	Number of cities reporting				
	Popu- lation Group I	Popu- lation Group II	Popu- lation Group III	Popu- lation Group IV	All cities
50° F. or below.....	2	7	18	7	34
55° F. or below.....	3	0	4	1	8
58° F. or below.....	0	0	0	1	1
60° F. or below.....	3	5	6	6	20
65° F. or below.....	0	0	4	1	5
66° F. or below.....	1	0	0	0	1
70° F. or below.....	1	0	2	1	4
Unsatisfactory reports or no requirements.....	2	4	16	5	27
Total cities reporting.....	12	16	50	22	100

7. DISTRIBUTION

Number of distributors.—The average number of distributors serving milk to each 100,000 population increases from 10 for the larger

cities in Group I to 75 for the smaller cities in Group IV. In the larger cities there is a decidedly smaller number of raw-milk distributors, and the bulk of the supply is handled by Pasteurization plants serving a relatively large number of consumers compared to the average distributor in the smaller cities.

Referring to Table VII, it is apparent that in the larger cities, having on an average a much smaller number of distributors, there are slightly more individual producers per 100,000 population than is found in the smaller cities. As the producers are relatively much more numerous than the distributors, however, the relative amount of milk-control work per 100,000 population necessary in the large cities is somewhat greater than would be required in smaller cities provided effective supervision is maintained over production methods and equipment.

Permits required.—In all cities included in the present survey each distributor is required to obtain a permit for the sale of milk or milk products. Although not always so specified in the survey reports, permits are practically always issued by the health department in accordance with an established ordinance or regulations that usually include the power to revoke any permit or to suspend or discontinue the sale of milk that does not meet the requirements of health-department regulations. Such police power is an extremely valuable weapon in the hands of the health officer, especially in the absence of other means of controlling the quality or purity of this commodity.

The number of permits revoked and the direct or ultimate effect of such action upon the quality of milk offered for sale could not be determined from the data contained in the schedules.

Grades of milk sold.—Table XXII shows the number of grades of milk sold in the 94 cities for which this information is available.

TABLE XXII.—Number of grades of milk sold, as reported by 94 cities,¹ 1923

Population group	Num-ber of cities report-ing	Number of grades reported							
		1		2		3		4 or more	
		Num-ber cities	Per cent	Num-ber cities	Per cent	Num-ber cities	Per cent	Num-ber cities	Per cent
I.....	12	0	0	3	25	7	58	2	17
II.....	16	0	0	6	38	10	62	0	0
III.....	46	0	0	18	39	15	33	13	28
IV.....	20	0	0	8	40	5	25	7	35
All groups.....	94	0	0	35	37	37	39	22	24

¹ No data recorded for Lynn, New Bedford, Omaha, St. Joseph, Savannah, Wilmington.

None of the 94 cities reported the sale of only one grade of milk. The most frequent practice was the recognition of three grades, 37 cities so reporting, and in this group the most usual combination was

one grade of Pasteurized and two grades of raw milk. Thirty-five cities were served with two grades (raw and Pasteurized). In the 22 cities in which four or more grades were sold there were usually two grades of Pasteurized and two or more grades of raw milk.

Percentages of milk sold as Pasteurized, certified, and raw.—In Table XXIII the average percentages of milk sold as Pasteurized, certified, and raw, other than certified, are given for each population group.

TABLE XXIII.—*Percentage of milk sold in different grades, 1923, in 84 cities*

Population group	Percentage of milk sold as—					
	Pasteurized		Certified		Raw, other than certified	
	Number of cities having this grade	Per cent	Number of cities having this grade	Per cent	Number of cities having this grade	Per cent
I.....	12	97.1	12	1.5	9	1.4
II.....	16	88.6	11	.6	14	10.8
III.....	39	72.3	27	.9	37	26.8
IV.....	17	75.3	9	.4	17	24.3
All cities.....	84	90.0	59	1.2	77	8.8

In the 83 cities for which consumption data, in gallons, were available, nine-tenths of all milk sold was Pasteurized. The remaining supply was sold as raw milk, approximately one-eighth of which was of certified grade. The larger cities in Group I reported an average of slightly over 97 per cent Pasteurized, Group II slightly over 88 per cent, Group IV a little over 75 per cent, while Group III reported the lowest average, or 72.3 per cent. The percentages for cities in each group varied considerably. In Group I the lowest percentage reported was 86, the highest being 99.5. The lowest percentage reported for Group II was 60, while two cities reported 99. In Group III the range was from 7.7 to 99 per cent, 25 cities reporting percentages lower than the average for this group. The lowest percentage reported for Group IV was 10,² the highest being 98.5 per cent, approximately one-half of the entire group falling below the general average (75.3), while 8 cities reported 90 per cent or over.

Compared with the records for 1920,³ there appears to have been a very commendable increase in the percentage of milk Pasteurized in the three groups of larger cities (cities of over 100,000 population included in both surveys). In 1920, of the 78 cities reporting,

² Savannah reported only 5 per cent of its milk was Pasteurized, but this city is not included in Table XXIII because of incomplete data.

³ Report on survey of 83 cities for 1920; Public Health Bulletin No. 136.

18 Pasteurized 95 per cent or more of all milk sold. In 1923, out of 74 cities in the same population groups, 27 cities reported that 95 per cent or more of all milk sold was of Pasteurized grades, representing an increase of approximately 50 per cent in the number of cities attaining this high average.

The sale of certified milk was reported by 62 of the 100 cities in 1923, as compared with 45 of the 83 cities included in the 1920 survey. Table XXIII gives the average percentages of certified milk for each size group, 59 cities supplying the necessary data. On this basis the larger cities consumed more certified milk than the smaller ones, although even in Group I only 1.5 per cent of all milk sold was of a certified grade. In individual cities the total daily consumption

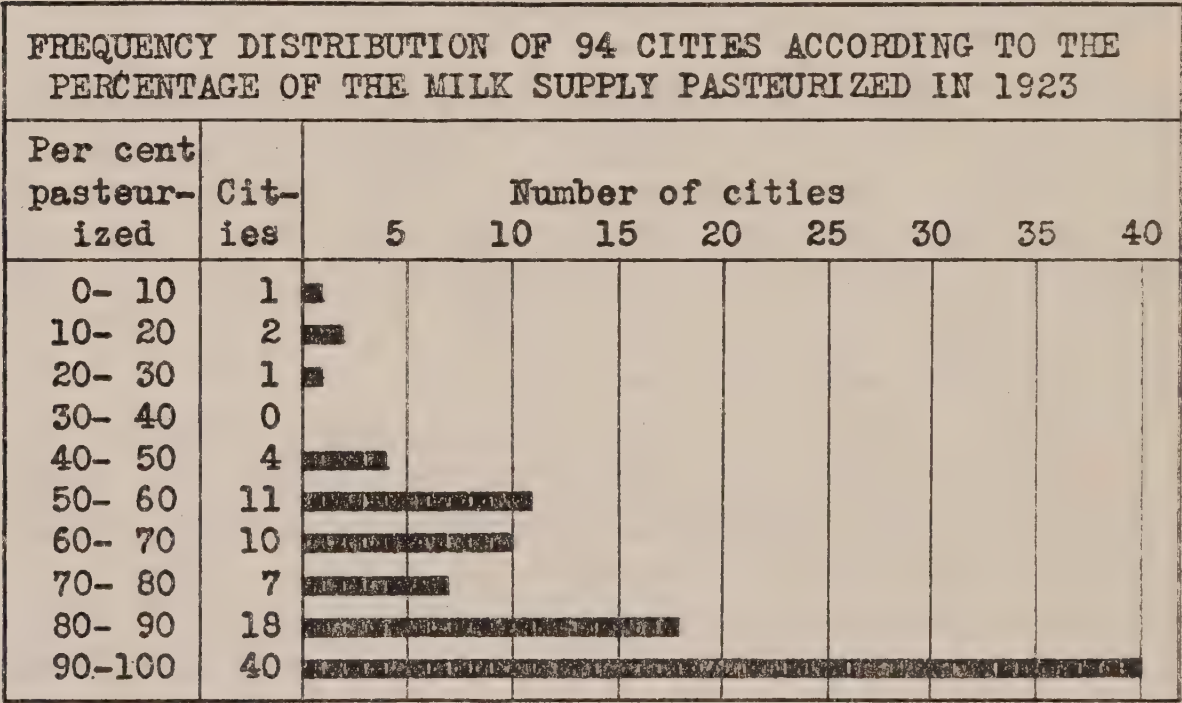


FIG. 10

reported varied from 8 gallons in Duluth to 10,000 gallons in New York City. The highest percentage reported was for Norfolk (7.6).

The percentage of raw milk of various grades other than certified for the average city in each group is also given in Table XXIII. In Group I the sale of raw milk averaged slightly less than the reported sale of certified milk. With considerable variations in individual cities in each group the average was highest in Group III (26.8 per cent). The average for cities of over 500,000 population was 1.4 per cent; for cities below 500,000 it was approximately 20 per cent.

Temperature requirements during distribution.—The requirement that milk shall be held at a temperature of 50° F. during delivery to the consumer appears to have been the most common practice in the cities reporting in 1923; 58 cities in all, including 67 per cent of the larger cities, specifying this temperature as the permissible maxi-

mun. Only three of the 100 cities permitted temperatures above 60° F. (information missing for 16 cities).

Table XXIV gives the maximum temperatures allowed in the cities reporting. The information available does not, however, indicate how effectively such requirements were enforced. Adequate means for proper refrigeration of milk in transit from the producing dairy to the consumer during warm weather are essential if the consumer is to receive this commodity in a satisfactory condition. The distributor's responsibility ceases when the milk is finally delivered and the consumer is then responsible for keeping the milk at proper temperatures until used. Careful technique in controlling the sanitary quality of milk before delivery is readily nullified by lack of attention to this important subject of refrigeration on the part of the consumer.

TABLE XXIV.—*Temperature requirements for the distribution of milk, 1923*

Temperature required	Number of cities reporting				All cities
	Popula- tion Group I	Popula- tion Group II	Popula- tion Group III	Popula- tion Group IV	
40° F. or below.....	0	0	1	0	1
45° F. or below.....	0	0	0	0	0
50° F. or below.....	8	9	28	12	57
55° F. or below.....	1	0	3	1	5
58° F. or below.....	0	0	0	1	1
60° F. or below.....	3	2	7	5	17
65° F. or below.....	0	1	2	0	3
None specified.....	0	4	9	3	16
Total cities reporting.....	12	16	50	22	100

Percentage of milk delivered in bottles.—Approximately 86 per cent of all milk distributed in the 82 cities reporting on this item was delivered in bottles. The average for Group I was the lowest, 83 per cent. Cities in Groups II and III average 90 per cent, while the average for cities under 100,000 was slightly higher (91 per cent). The percentage reported by individual cities varied from 40 per cent in Nashville to 100 per cent in Baltimore, Birmingham, Fall River, Indianapolis, Manchester, Peoria, Seattle, and 13 other cities.

The objections to the practice of "dipping" milk in retail trade are rather generally recognized. Dipped milk is still permitted in soft-drink establishments in some cities, and this method of retailing the product probably still prevails in some of the cities in the group under consideration in certain stores and among smaller distributors. Very little information is available, however, in the present survey data, so that further discussion of this practice of distribution is necessarily abandoned.

Preventing the sale of condemned milk.—Seventy-five cities reported the method used to prevent the sale of milk that had been

condemned by the health department for various violations of regulations or for other reasons. Such milk was "destroyed" or "dumped" in 42 cities, denatured in 17, "returned" in 6, dumped or denatured in 4, destroyed or labeled in 1, while 9 cities reported various combinations of these methods.

Milk was "denatured" by the use of coloring matter (12 cities), rennet (9 cities), and vinegar (1) city.

Sale of reconstructed milk.—Of the 98 cities reporting upon this item (no information for Troy and Utica), only 26 cities permitted the sale of reconstructed milk, the percentage of cities so reporting being nearly equal in all groups.

8. QUALITY

In order to measure, comparatively, the quality of milk sold in the various cities, it is necessary that there be some acceptable standard of measurement in common use by local health departments, data for which can be collected and analyzed. In the absence of such data it is necessary to apply some reasonable standard of measurement or resort to other expedients in attempting to estimate or compare the quality of this product. No such standard has been universally adopted, and it is, therefore, difficult to compare the average quality of milk sold in the various groups of cities.

The use of score cards.—For dairy-farm inspection 70 cities reported the use of score cards, 53 cities having adopted the forms in use by the United States Department of Agriculture while 17 cities used some other form of score card. Dairy farms were not scored in 5 cities (no report for 25 cities). Score cards for dairy-farm inspection were in use in nearly 90 per cent of all cities of over 250,000 population and by approximately 62 per cent of the smaller cities.

Only 32 of the 70 cities reporting the use of score cards for dairy-farm inspection supplied the average scores obtained. The average score for these 32 cities was approximately 70 per cent, one city reporting an average score of 49, one 53.5, 7 between 60 and 69, 18 between 70 and 79, 4 between 80 and 86.

For city milk-plant inspection, 47 cities reported the use of score cards, 28 cities using the Federal department form, while some other type of card was in use in 19 cities. Two cities did not score city milk plants (information not given for 49 cities).

Twenty cities reported the average scores obtained in city milk-plant inspection. The average score for 2 cities fell between 60 and 69 per cent, for 5 cities between 70 and 79, for 13 cities between 80 and 89. The average score for the 20 cities reporting was about 79.

The use of scoring devices primarily adapts itself to the recording of estimates of methods used in the production and handling of milk.

Credits or penalties for high temperatures, sediment, or other physical irregularities, and for bacterial counts exceeding the maximum contamination permitted by milk ordinances give greater weight to the milk score.

The regulations adopted by Memphis in 1924 for the determination of the milk score are of interest in that the usual dairy score is combined with a score representing the quality of the milk to make a possible maximum of 100. A maximum of 50 points is allowed for "hygiene of the dairy" on the basis of the B. A. I. score card, and a maximum of 50 points for the quality of the milk itself as determined by chemical, bacteriological, and physical examinations.

Of the 50 points allotted for quality, a possible 25 are for bacterial content, ranging from the full 25 for a count of 50,000 per c. c. or less, to zero for a count of over 200,000 in the case of Pasteurized, and over 500,000 in the case of raw milk. Another maximum of 10 points is allowed for butterfat, ranging from the full 10 points for a content of 4.5 per cent or over, to zero for less than 3.5 per cent. Similarly, for solids not fat the maximum score of 10 points is allowed for a content of 9 per cent or over, graduated down to a score of zero for less than 8.5 per cent. The remaining 5 points are for temperature at time of delivery, the maximum score being allowed for a temperature of 50° F. or lower, down to a zero score for over 60° F.

A deduction of 5 points is made for each day that excessive sediment is found, also for each sample analyzed which shows that the butterfat or solids not fat, or both, were below the required standard. A minimum total score of 70 is required by ordinance.

While the present survey indicates that reported conditions at producing farms and city milk plants average about 70 and 79 per cent, respectively, as shown by the scores for the cities reporting, these data fail to give any adequate idea of the relative quality of the milk supply in those cities. The score of 79 per cent, for example, is no index of the degree to which legal Pasteurization requirements have been fulfilled.

Personal estimate of quality.—According to the opinions expressed by the local health officers of the cities surveyed, the average quality of the milk sold in 20 cities was considered as "excellent," in 36 cities "good," in 14 "fair," in 4 "poor" (no estimate for 26 cities).

These estimates have no comparative value, as there is no practical basis for such a comparison. It merely indicates that in the 100 large cities 56 per cent of the health officers were of the opinion that the quality of milk sold under their supervision was either good or excellent, while 18 per cent considered it fair or poor, or, in other words, unsatisfactory.

Sampling interval.—The frequency with which samples of milk are collected for laboratory analysis vary within rather wide limits. Samples taken from distributing plants or during delivery are examined at more frequent intervals than are samples collected from dairy farms. The average sampling interval in days at dairy farms

was 75 days in 31 cities reporting, while 63 cities reported an interval of only slightly over 21 days for samples from distributing plants, as shown in Table XXV.

TABLE XXV.—Average sampling interval in days

Sources of samples	Population groups				All cities
	I	II	III	IV	
Farms:					
Number of cities reporting-----	5	4	15	7	31
Average sampling interval in days-----	108	84	69	59	75
Distributers:					
Number of cities reporting-----	9	9	29	16	63
Average interval in days-----	6.5	22	28	18	21.6

From the data available it is to be noted that the larger cities evidently sample milk at the farms much less frequently than do the smaller cities. For this item the most usual frequency of sampling was 30 days (13 cities). Twelve cities reported intervals varying from 60 days to one year, while only 6, or approximately 20 per cent of the cities reporting, sampled at shorter intervals, namely, two cities every 15 days, and 4 cities every 7 days.

The large cities (Group I) collected milk samples from distributors much more frequently than was the average practice for cities in the other three groups, the interval in the latter groups being at least three times as long as that reported for the larger cities in the first group. Although the most usual frequency of sampling from distributors was 30 days (16 cities), 14 cities reported intervals of from 8 to 15 days, while the interval in 13 cities was 7 days, in 8 cities from 2 to 6 days, 8 other cities reporting daily sampling.

The apparent tendency toward a greater frequency of sampling after the milk reaches the city is probably due, in part, at least, to the fact that these samples can be more satisfactorily collected and examined, often with inadequate personnel, than can samples from producing dairies, which are more numerous and frequently located at considerable distance from the city.

Bacteriological standards.—Aside from certain physical and chemical standards, usually prescribed by State law and intended to regulate the solids and fat content of milk, the bacterial count is rather generally accepted as the most reliable index of the purity of this product.

In reporting laboratory findings representing the bacterial content of milk samples some cities offer the arithmetic averages; others give maximum and minimum counts or the number of samples exceeding specified numbers of bacteria. In other records the number of samples that comply with local standards are given. For

these reasons it is difficult to compare the bacteriological quality of milk sold in different cities.

The arithmetic average of bacterial counts is not a fair measure of quality. The growth of bacteria is a logarithmic phenomenon and a few very high counts so materially affect the arithmetic average that it is not acceptable as a measure of the real average quality of milk.

Maximum and minimum counts have practically no significance in the absence of other data. For cities reporting percentages of counts complying with local standards, the value of such a report for comparative purposes is nullified by the fact that practically no two cities have adopted the same standards.

The percentages of bacterial counts falling under certain step limits, such as 50,000, 200,000, and 1,000,000, gives a fairly reliable means of comparing quality in terms of bacterial counts, but only relatively few cities reported the percentages of counts over 500,000, and only one city reported any other limit.

TABLE XXVI.—*Maximum bacteria counts allowed for various grades of milk 1923*

Maximum allowed per c. c.	Number of cities reporting maximum limit for—			
	Highest grade of Pasteurized	Second grade of Pasteurized	Highest grade of raw (excluding certified)	Second grade of raw
5,000	1			
10,000	2		3	
15,000	2		1	
20,000			1	
25,000	3	1	1	
30,000	9		3	
45,000	1			
50,000	26	4	10	2
55,000	1			
60,000			4	
70,000	1			
75,000		6	2	
100,000	20	2	19	6
150,000	3		3	2
200,000	4		7	2
250,000	1		1	1
300,000	1	1	2	1
500,000	2	1	10	4
1,500,000				1
Total cities reporting	77	15	67	19

The maximum numbers of bacteria per cubic centimeter that were allowed either by law, ordinance, or regulation in various grades of milk offered for sale in the large cities are shown in Table XXVI. It is obvious that the permissible bacterial content of milk of any selected grade varies between rather wide limits, with no great distinction between all grades of Pasteurized milk and the better grades of raw milk. More than half the cities reporting allowed not over

50,000 bacteria per cubic centimeter in the highest grades of Pasteurized milk, not over 75,000 in the second grade of Pasteurized, not over 100,000 in the highest grade of raw milk (excluding certified), and not over 150,000 in the second grade of raw.

For the best grades of Pasteurized milk (77 cities reporting) 11 cities allowed bacterial counts in excess of 100,000 bacteria per cubic centimeter, 48 cities between 50,000 and 100,000, inclusive, and 18 cities less than 50,000. For the best grades of raw milk, other than certified (67 cities reporting), 23 cities had maximum limits in excess of 100,000, 35 cities allowed from 50,000 to 100,000, inclusive, while only 9 cities required counts of less than 50,000. Bacterial limits as high as 1,500,000 were reported for the lower grades of raw milk.

Such an array of bacterial standards leads to the conclusion that the bacteriological quality of milk sold in different cities varies between rather extreme limits, the higher counts probably permitting the sale of milk of questionable quality when measured by bacterial content, generally accepted as a reliable index of freedom from excessive contamination or spoilage.

Existing practice in the attempt to control the quality of milk supplies by establishing bacterial standards remains in a chaotic condition and the desirability of more uniform requirements for different grades of milk should be seriously considered.

Publication of laboratory records.—Forty-one cities, out of 94 reporting, published laboratory records giving the results of examinations of milk samples. The percentage of cities publishing these records varied from 27 in the larger cities (Group I), 37 in Group II, and 47 in Group III to 50 in Group IV. The smaller cities evidently endeavored to utilize this means of publicity more frequently than did the larger cities.

Delivery of milk to infected premises.—In 60 cities the health department prohibited milk distributors from collecting their bottles at any premises where a case of contagious or infectious disease existed until these containers had been properly sterilized, usually under directions issued by the health department and after the release of the case from quarantine restrictions. In 35 cities milk dealers were not allowed to leave bottles at infected premises. (No report from five cities.)

The more usual custom in the larger cities (Groups I and II) was to control delivery at infected premises by prohibiting the collection of bottles during the illness of cases in quarantine. In the smaller cities the two methods referred to in the preceding paragraph were prescribed in approximately an equal number of cities.

9. MILK CONSUMPTION

According to the information given for 90 of the large cities, the average daily consumption of milk in 1923 was 0.83 pint per capita, slightly higher for cities in Group I (0.85) than in all other groups (0.81 pint). The following summary shows that the most usual consumption lies between 0.8 and 0.9 pint per capita (18 cities). Six cities⁴ consumed less than a half pint per capita per diem, while the daily average for 15 cities⁵ was between 1 and 1.4 pints per capita.

Daily per capita consumption of milk

Pint per capita	Number of cities reporting	Pint per capita	Number of cities reporting
Less than 0.5.....	6	0.8 to 0.89.....	18
0.5 to 0.59.....	12	0.9 to 0.99.....	15
0.6 to 0.69.....	7	Over 1.0.....	15
0.7 to 0.79.....	17		

The average daily consumption (0.83 pint per capita) for the 90 cities of over 70,000 population corresponds closely to the average of 0.81 pint per capita reported by Hiscock and Rice (1924 report, International Association of Dairy and Milk Inspectors) for 168 cities of over 25,000 population.

Extent of use of private milk supplies.—An estimate of the number of persons using milk from private cows was obtained from 56 cities. These estimates are summarized by population groups in the following table:

TABLE XXVII.—Extent of use of private milk supplies

	Population groups				All cities
	I	II	III	IV	
Number of cities reporting.....	5	10	29	12	56
Total persons served by private cows.....	2, 820	2, 975	40, 625	4, 600	51, 020
Per cent of total population.....	0.032	0.082	1.02	0.44	0.29

According to the data obtained by the survey, less than one-tenth of 1 per cent of the population in Groups I and II, approximately 1 per cent in Group III and less than one-half of 1 per cent in Group IV used milk from private cows.

⁴ Birmingham, Flint, Jacksonville, Kansas City (Kans.), Norfolk, Richmond.
⁵ Boston, Denver, Detroit, Hartford, Indianapolis, Jersey City,, Los Angeles, Lawrence, Nashville, Newark, Paterson, Peoria, St. Paul, South Bend, Springfield.

Memphis reported the largest percentage use of milk from private cows of any city in the present group, giving an estimate of 10,000 persons, or 5.9 per cent of the total population.

Eleven cities reported that no private milk supplies were used by any appreciable number of persons, including in Group II, Jersey City and Milwaukee; in Group III, Akron, Dayton, Paterson, Reading, Trenton, Utica, and Wilmington; in Group IV, Harrisburg and Lawrence.

10. MEDICAL MILK COMMISSIONS AND CERTIFIED MILK

Medical milk commissions were reported for less than half of the 100 large cities surveyed for 1923, the percentage of cities in the different population groups decreasing from 92 per cent in Group I to 32 per cent in Group IV. The average number of certified dairies recorded per city was 3.2, with a somewhat similar successive decrease in the four groups, as shown in Table XXVIII.

TABLE XXVIII.—Medical milk commissions and the sale of certified milk in 59 cities, 1923

	Population groups				All cities
	I	II	III	IV	
Number cities reporting medical milk commissions.....	11	10	20	7	48
Per cent of cities reporting commissions.....	92	63	40	32	48
Total number certified dairies reported.....	79	23	42	10	154
Average number certified dairies per city.....	6.6	2.6	2.1	1.4	3.2
Number of cities reporting sale of certified milk.....	12	11	27	9	59
Total gallons of certified milk sold daily.....	28,084	3,374	5,337	682	37,477
Average number gallons per 100,000 population.....	162	92	128	84	144

Increasing consumption of certified milk.—The average daily consumption of certified milk in the 59 cities giving the necessary data was 576 quarts per 100,000 population, with the following variations in the different groups.

Compared with the findings reported for 1920, the present study indicates some increase in the average consumption of certified milk. In 1920, 45 cities of 100,000 population or over reported an average daily sale of 500 quarts per 100,000 population, while in 1923, 50 cities in the same grouping reported an average of 585 quarts. The average daily consumption for cities in Group I was increased from 464 quarts in 1920 to 648 quarts in 1923. For cities in Groups II and III there was an increase during the same period from 280 to 446 quarts.

Health-department control over certified milk was reported as “effective” in 36 cities in 1923, “fair” in 4 cities, and “unsatisfactory” in 5 cities. (No report for 14 cities.) Nearly all of the

cities in Groups I and III reported effective control, while half of the cities in Groups II and IV reported fair or unsatisfactory control.

PROGRAM FOR MUNICIPAL MILK CONTROL

The lack of uniform methods and the wide variations in standards, specifications, and regulatory measures emphasized in the preceding analysis ought to encourage a more serious and critical study of milk-control practices and policies. A local health officer, in the present state of confusion, may well raise the question, How shall I attempt to control the production, handling, and distribution of milk intended for sale within my jurisdiction?

Giving due weight to past experiences, the more generally accepted features of milk-control activities do not necessarily constitute the best practice. The following discussion is presented as a general outline of a milk-control program, based in part upon present practice, but including such suggestions as appear desirable and essential to improved methods. The purpose of this outline is to emphasize some of the more fundamental principles that should underlie administrative attempts to regulate the quality and sale of milk, such as—

1. The nature and purpose of an effective milk ordinance.
2. The personnel needed for satisfactory control.
3. An adequate budget for milk-control activities.
4. The function of State health authorities in presenting uniform practice and improvement in quality of milk supplies.

1. *The essential features of a milk ordinance.*—Without reference to relative importance, the following objectives should be given consideration in any attempt to enact or revise a municipal milk ordinance:

(a) Uniformity in administrative procedures and requirements, adapted to the needs of cities of different size, irrespective of previous experience in milk control and the percentage of milk already being Pasteurized.

(b) Increased percentage of properly Pasteurized milk.

(c) Improvement in the quality of milk before Pasteurization.

(d) Improvement in the quality of all raw milk.

(e) Legislation and enforcement intended to secure the cooperation of the dairy industry.

(f) The reduction of court cases to a minimum.

(g) Adequate milk consumption.

There is no doubt as to the desirability of such objectives although some health officers may question the possibility of attaining some of them. The advantages of uniform milk ordinances appear most obvious. A number of public-health organizations have, by resolu-

tions, emphasized the desirability of attaining greater uniformity in milk-control legislation and methods. It has been brought out forcibly that if health officials are to earn the respect of the milk producer and the confidence of the milk consumer they must endeavor to bring order out of the present chaotic condition of milk control, so that the dairy industry may be convinced that municipal control is becoming more reasonable and uniform in its application.

One of the most significant facts brought out by the present study is this heterogeneity of milk-control methods. The almost endless variety of requirements in different cities in respect to cooling temperatures, time, and temperature periods for Pasteurization, sterilization methods, bacteriological standards, and grading systems are indications of the need of a more general agreement upon the factors essential to adequate and safe milk supplies.

For the purpose of encouraging public-health officials, both State and municipal, to consider more seriously the need and advantages of reasonably uniform practice in efforts to regulate the production and handling of milk, the present State-wide program of the United States Public Health Service has given promise of most encouraging results. This program includes a basic ordinance and a uniform plan of State and city relationship. It has already been adopted by 10 States and enacted into law by over 70 municipalities.

The difficulties attendant upon attempts to secure a fairly universal adoption of any so-called "standard" milk-control program have been by no means insurmountable. The accumulating experiences of a relatively large number of practical health officials in the operation of the present unified program will make it possible to extend or modify it from time to time in order to improve it and increase its adaptability to varied requirements. Organized conferences of State and municipal health authorities could profitably undertake to critically prepare and analyze the practical application of its more essential features and propose such revisions or additional requirements as may be considered necessary in the light of past experiences. Some such plan of action will be required to bring about a general improvement in our present methods of milk control.

2. *Personnel needed for satisfactory control.*—From Table III it is to be noted that the average number of whole-time personnel employed for milk control per 100,000 population for all city groups was 1.23, this average being low because of inclusion of many cities having obviously inadequate personnel.

Practical experience in milk-control activities indicates the necessity of employing at least two whole-time inspectors per 100,000 population. With a less adequate force many cities would be forced to neglect supervision over sources of production, limiting them-

selves largely to the control of Pasteurization and distribution. Practice of this sort might readily encourage the sale of milk from producing dairies that otherwise would fail to meet local requirements, and at the same time justify the objections raised against Pasteurization as a cure-all for milk of questionable or unknown quality. Although some cities will require a larger number of inspectors, depending upon the number and location of producers needing supervision, two whole-time inspectors for each 100,000 population is therefore to be recommended.

The principle function of milk inspectors is the control, by inspection, of dairy farms, Pasteurization plants, and distributors, and the collection of the necessary milk samples. It is believed that under usual conditions the farms should be inspected at least once every two months, and Pasteurization plants not less frequently than once each week. Not less than 12 samples per year should be collected from each producer's supply, the frequency of sampling from distributors depending upon the quantity of milk sold, samples being collected from the larger distributors at least once each week. The activities just outlined are believed to represent average minimum requirements of a reasonably adequate inspection service.

Suitable and adequate provision should always be made for laboratory service. For cities of 100,000 population the necessary laboratory examinations of milk samples will require from one-half to whole-time service of one technician, depending, of course, upon the extent and character of the laboratory work considered necessary.

In the larger cities and for actual supervision in the smaller cities part of one clerk's time will be required for the necessary bookkeeping and record work.

For cities undertaking to carry on tuberculin testing the services of a veterinarian will be required. A city of 100,000 population would require one-half to whole time on the part of one veterinarian.

The most usual method adopted by municipal health authorities for administrative organization for milk control has been a combined milk and food inspection division under the supervision of a single director. The direction of milk-sanitation activities need not necessarily be placed under a separate divisional director, as there appears to be no apparent advantage in providing a separate organization except in the larger cities. In cities of less than 100,000 population a separate division would probably not seem justifiable from an economic standpoint unless the division director gave most of his time to field work.

3. *An adequate milk-control budget.*—The average annual expenditure for milk control for cities of all groups (Table VI) was 3.68 cents per capita, equivalent to an appropriation of \$3,680 per annum

per 100,000 population. Such a budget is obviously inadequate. No city of 100,000 population can possibly hope to solve its milk-sanitation problems adequately and effectively upon so small an allotment. It is believed that the minimum expenditure that should be provided for an average city of 100,000 population is about \$7,000, depending upon the salary scale adopted. For less than this amount it would be difficult to provide two qualified inspectors, their traveling expenses, and the part-time services of one technician and a clerk, including laboratory supplies. If the services of a veterinarian are engaged, an additional allowance for his salary and traveling expenses will be necessary.

4. *The function of State health authorities.*—It is believed that the principal functions of State health authorities in respect to milk-control activities should be—

- (a) To encourage the enactment of uniform legislation.
- (b) To encourage uniform inspection methods.
- (c) To promote uniform laboratory technique.
- (d) To measure results.

As previously indicated, there is a growing conviction concerning the advantages of uniform milk-control methods. In developing such a program a uniform milk ordinance is one of the essential items, and inspection methods and laboratory technique should be sufficiently uniform to enable health authorities to compare their records and accomplishments and to perfect their methods of profiting from the experiences of others. Progress toward unification or standardization of milk-control activities should not prevent or discourage individual initiative and experimentation or trial of new methods.

In the promotion of more effective supervision and control over the production and handling of milk, State health authorities have a very definite responsibility which should be exercised by assuming leadership in devising and developing a well-defined program intended to coordinate the activities of all municipalities within their respective States so that ultimately each community will profit by a well-balanced state-wide program.

With the growth of large centers of population, vast quantities of milk produced in one State are shipped daily to other States, so that many cities receive part or most of their supply from territory outside their jurisdiction and beyond the control of the State health authorities concerned in their interests. To bring about effective supervision over the interstate shipment of milk, concerted action and reciprocal relations on the part of State health authorities are necessary. In this connection the United States Public Health Service can materially assist the individual States by encouraging

the gradual development of a national milk-control program that will eventually encompass all milk wherever produced or sold.

The exercise of the State's responsibility in the control of milk supplies should not be regarded as an encroachment upon the prerogatives of local self-government, but rather as a means of increasing the respect of both the producer and the consumer for municipal milk control. The State should not violate the authority of the city over those engaged in the production and distribution of its milk supply, but, on the other hand, the city should assist in developing the uniform methods advocated by the State.

A bureau or office of milk control should be established in each State health department with well-qualified inspectors or supervisors, whose duties would be to cooperate with local health authorities and assist them in solving their immediate problems and, at the same time, to further the general policy formulated by the State authorities. In cities undertaking to enforce some standard grading ordinance, such as the one recommended by the United States Public Health Service, the State inspector should check regularly their methods and results and certify to those meeting with his approval. This procedure will protect city inspectors from accusations of unfairness or lack of uniform inspection or grading methods raised by the local dairy industry or by those from other cities. It would undoubtedly tend to bring about the solution of a problem which is frequently very vexing, namely, the hesitancy on the part of one city to accept the inspection reports of other cities covering milk shipped into its territory.

The necessity of uniform laboratory methods used in the examination of milk samples is obvious. Local health departments should cooperate with the State authorities in developing, as far as practicable, uniform laboratory technique and methods of expressing the results of examinations.

One other important function of the State health authorities is to compile and measure the results or effects of milk-sanitation work carried on within the State. It is believed that this should be undertaken annually. The milk-sanitation ratings of the cities should be determined by means of some such method as that proposed by the United States Public Health Service. The determination of these ratings should serve two purposes—they should serve as a means of measuring, from year to year, the progress of milk sanitation within the State, and they should tend to encourage a healthy rivalry as between cities and bring about more rapid progress in milk-control activities. The use of a uniform rating method by all State authorities has obvious advantages, and the one just referred to could profitably be adopted until a more satisfactory method is developed.

SUMMARY

State control of milk production in the large cities is either limited or absent; in no case is it complete. Under municipal health departments milk control in 1923 was organized as a separate division in only 10 of the 100 cities, the usual practice being to combine milk control with food inspection alone or with food inspection and other activities. Consequently only 17 cities had a whole-time director who devoted all his time to milk control.

An average total of 1.23 whole-time and 0.86 part-time personnel was employed for milk control per 100,000 population. The average salary paid veterinarians devoting whole time to milk-control work was \$2,500 per annum and inspectors \$1,680 per annum. The average expenditure for milk control was 3.68 cents per capita.

The average percentage of cows tuberculin tested in the cities under consideration was 62.6, and 7.4 per cent were found to be reactors. Tuberculin testing is usually done by State and Federal authorities or by private veterinarians, in most cases at annual intervals.

Only 14 cities, chiefly the smaller ones, required physical examinations of dairy-farm employees. The use of some form of utensil sterilization at dairy farms was reported by 78 cities, the majority permitting hot-water sterilization, although some require steam and others allow the use of chemicals. A milk temperature of 60° F. or lower at dairy farms was required by 77 cities, and 50° F. or lower by 45 cities. Producers' permits were required by somewhat less than one-half of the cities, and the average city inspected dairy farms a little oftener than twice each year. There was an average of 768 producing farms per 100,000 population.

For Pasteurization, more cities required a temperature and time combination of 142° F. for 30 minutes than any other, with 145° F. for 30 minutes a close second. Practically all cities reported the use of recording thermometers. Physical examination of employees engaged in Pasteurization and distribution was required in 39 cities. Steam was most commonly depended upon for sterilization at Pasteurization plants. Over half the cities inspected Pasteurization plants at least weekly. For milk in transit from the producer to Pasteurization plants the majority of cities required a temperature of 60° F. or lower, while 50° F. or lower was required more often than any other temperature.

The average number of distributors was 25.8 per 100,000 population, the figure being much higher in the smaller cities than in the larger. Distributors' permits were required by all cities. Over half the cities required a temperature of 50° F. or less during distribu-

tion. Eighty-six per cent of all milk was reported as being delivered in bottles. Nearly two-thirds of the cities prohibited the collection of bottles from infected premises.

Two grades of milk were recognized by 35 cities, three grades by 37 cities, and four or more grades by 22 cities. About 90 per cent of all milk sold was Pasteurized and 1.2 per cent certified, both figures being higher in the larger cities than in the smaller. The average daily consumption of milk was 0.83 pint per capita. Only about one-fourth of 1 per cent of the total population of the 100 cities was served by private milk supplies.

There were medical milk commissions in 48 cities, and while the control of certified milk was generally reported as effective in the large cities, half of the health officers of the small cities considered the control only fairly effective or unsatisfactory.

So great a variety of milk standards and control measures was employed that it is difficult to estimate or compare the quality of milk in different cities. Of the 70 cities which scored dairy farms 32 reported scores averaging 70. Of the 47 cities which scored milk plants 20 reported scores averaging 79. The average interval of milk sampling was 75 days for farm milk and 22 days for distributor's milk, large cities sampling less frequently than small cities. More than half the cities allowed not over 50,000 bacteria per cubic centimeter in the highest grade of Pasteurized milk, not over 75,000 in the second grade of Pasteurized, not over 100,000 in the highest grade of raw (excluding certified), and not over 150,000 in the second grade of raw. Somewhat less than half the cities published laboratory results. Most cities endeavored to prevent the resale of condemned milk by destruction or by denaturing. One city in every four permitted the sale of reconstructed milk.

A proposed milk-control program is outlined with a discussion of milk ordinances, personnel, and budget needed for satisfactory control, and the function of State health authorities in unifying milk-control practice.

XV. FOOD AND DRUG CONTROL

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A. Food Control

ORGANIZATION

Agencies engaged.—The control of food (exclusive of milk, which is considered in another section²) is a function of the municipal health department in all of the 100 cities surveyed. The extent of control over food by different State agencies varies considerably from city to city, but is, in practically all cases, less complete than that of the municipality itself, and in some instances entirely nil. Federal food-control activities are generally confined to meats and other foods intended for interstate shipment.

The control of drugs,³ except in some of the larger cities, is usually left entirely to State and Federal authorities.

Health department organization.—The municipal control of drugs, as well as of food, is almost invariably under the health authorities. How these functions were organized in the health department in 1923 is summarized in Table I.

TABLE I.—*Organization of food-and-drug-control activities in the health departments of 100 cities, 1923*

Population group	Total number of cities	As a separate function		Food and drug control combined with—				
		Organized as a division	Not organized as a division	Milk	Milk and sanitation	Milk and laboratory	Sanitation	Laboratory
I.....	12	1	1	8				2
II.....	16	1		11	3		1	
III.....	50	3	13	17	9	4	4	
IV.....	22		9	11	1	1		
All cities.....	100	5	23	47	13	5	5	2

It is evident that comparatively few health departments separated their food and drug control from other functions. Indeed, in 1923 only five cities maintained an organized bureau or division for the

¹ Revised and amplified in accordance with data on file in the office of administrative health practice.

² Throughout the chapter on Food and Drugs the term "food" will be understood to mean foods other than milk.

³ See pp. 459-463.

control of food and drugs exclusively.⁴ In 23 other cities these activities, while separated from others, were not organized as a distinct bureau or division.⁵ In the majority of cities food and drug control was combined with milk inspection alone or with milk inspection and other activities.

The separation of food control from other health-department activities is more common in the smaller cities than in the larger. This condition is largely due to the fact that in many of the smaller cities the various inspectors work more or less independently of each other and report only to the health officer.

PERSONNEL

Table II shows the number and percentage of health departments having a whole-time director or chief in charge of food and drug control, also the average number of whole-time and part-time veterinarians, inspectors, and other personnel on food and drug control per 100,000 population.

TABLE II.—*Personnel engaged in food and drug control, 100 cities, 1923*

	Population groups				All cities
	I	II	III	IV	
Number of cities.....	12	16	50	22	100
Total population.....	17,340,168	5,589,138	7,310,265	1,915,525	32,155,096
Food and drug control in charge of—					
Whole-time director or chief, cities.....	3	1	10	3	17
Per cent of total cities.....	25	6	20	14	17
Average number of personnel per 100,000: ¹					
Veterinarians, whole-time.....	0.25	0.72	0.31	0.10	0.34
Veterinarians, part-time.....	.01	.30	.21	.41	.13
Inspectors, whole-time.....	1.39	1.84	1.45	.89	1.46
Inspectors, part-time.....	.17	1.30	.91	.90	.58
Other employees, ² whole-time.....	.23	.05	.03	.00	.14
Other employees, part-time.....	.11	.65	.41	.47	.29
Total personnel, whole-time.....	1.87	2.61	1.79	.99	1.94
Total personnel, part-time.....	.29	2.25	1.53	1.78	1.00

¹ Director or chief of division included.

² Clerical and laboratory personnel, physicians engaged in examination of food handlers, and those directors or chiefs of divisions who could not be classified as veterinarians or inspectors.

That so few cities have a whole-time director or chief for food and drug control is apparently due largely to the fact that this activity is not organized as a separate function in many cities; for where it is carried on, in conjunction with other work, the director or chief may be a whole-time employee, but necessarily devotes only part of his

⁴ Group I, Los Angeles; Group II, Denver; Group III, Cambridge, Oakland, Providence.

⁵ Group I, San Francisco; Group III, Albany, Atlanta, Des Moines, Duluth, Houston, Kansas City (Kans.), Lowell, Norfolk, San Antonio, Springfield, Tacoma, Wilmington, Worcester; Group IV, Evansville, Fort Wayne, Lawrence, Manchester, Peoria, Savannah, Somerville, Troy, Wilkes-Barre.

time to foods and drugs. In 19 cities⁶ the health officer directed the work; in 9⁷ the chief in charge of food and drugs inspection was a part-time employee in the health department; and while in the remaining 72 cities he was a whole-time employee he devoted all of his time to food and drug control in only 17⁸ of these.

Of the 81 cities, where the health officer did not direct the work, the chief of food and drug control was a veterinarian in 23 cities, an inspector in 31, a physician in 3, and in the remaining 24 he was designated as "superintendent," "chief," "director," "supervisor," "sanitary engineer," "sanitarian," "bacteriologist," and so forth. A few cities maintained two chiefs, one for meat and one for other foods.

In 1923 approximately two whole-time and one part-time personnel of all kinds were employed per 100,000 population on food and drug control exclusively. The ratio of lay inspectors to veterinarians engaged was more than 4 to 1. Where veterinarians were employed they usually inspected slaughtering, while lay inspectors covered all other work. Nearly one-half of the cities were reported as having no veterinarians for food control. In 30 cities, chiefly the larger ones, additional personnel (clerical, laboratory, etc.) were available for this work, most of these being whole-time employees who divided their time between food and other work.

The larger cities generally employed for food and drug work exclusively more whole-time than part-time veterinarians and inspectors. For cities under 100,000 the reverse obtained. Cities of 250,000 to 500,000 employed by far the largest number of veterinarians, inspectors, and other personnel in proportion to population.

EXPENDITURES

The average annual expenditure by health departments for the control of food (excluding milk) and drugs in 1923 was about 4½ cents per capita. This figure is for the 62 cities where it was possible to segregate food and drug expenditures from milk, sanitation, or other activities. Expenditures are presented by population groups in Table III.

⁶ Indianapolis, Jersey City, Des Moines, Duluth, Fort Worth, Lowell, New Haven, Syracuse, Tacoma, Utica, Wilmington, Canton, Fort Wayne, Harrisburg, Manchester, Peoria, Sioux City, Troy, Waterbury.

⁷ New Orleans, Ellizabeth, Nashville, New Bedford, Salt Lake City, Springfield, Knoxville, Schenectady, Wilkes-Barre.

⁸ Los Angeles, St. Louis, San Francisco, Denver, Albany, Atlanta, Cambridge, Houston, Kansas City, Kans., Norfolk, Oakland, Providence, Richmond, Yonkers, Lawrence, Savannah, Somerville.

TABLE III.—*Health department expenditures in 62 cities for control of food and drugs (excluding milk), in 1923*¹

Population group	Number of cities	Population	Annual expenditure			Per cent of total for salaries
			Total	Average per city	Average per capita	
					<i>Cents</i>	
I.....	9	8,869,388	\$361,245	\$40,100	4.07	94
II.....	5	1,597,828	106,540	21,300	6.66	91
III.....	33	5,032,935	230,744	7,000	4.58	93
IV.....	15	1,322,929	48,982	3,300	3.70	89
All.....	62	16,823,080	747,512	12,100	4.44	93

¹ Includes only those cities for which it was possible to separate food-control expenditures from milk, sanitation, etc.

The average expenditure per city for this activity decreases as the population decreases. The average per capita expenditure is highest in Group II and lowest in Group IV.

Of the 62 cities for which cost data on food control could be separated from other expenditures, Oakland spent the most (16.8 cents) per capita and St. Louis the least (0.8 cent) for this work. The maximum and minimum per capita expenditures, respectively, by groups are as follows: Group I, San Francisco, 9.6 cents; St. Louis, 0.8. Group II, Columbus, 10.5 cents; Indianapolis, 4.5. Group III, Oakland, 16.8 cents; Springfield, 1.0. Group IV, El Paso, 11.0 cents; Peoria, 1.1.

Since salaries constituted, on the average, over 90 per cent of all expenditures for food and drug control, it is of interest to note what salaries were paid to personnel engaged in this work. Part-time employees can not be readily compared, as their salaries depend largely on the amount of time devoted to their work. Table IV shows the maximum, minimum, and average salaries paid veterinarians and inspectors devoting whole time to food and drug control, by population groups, in 55 cities for which salary rates are fully available.

TABLE IV.—*Annual salaries of veterinarians and inspectors devoting whole time to food and drug control (excluding milk), 55 cities, 1923*

Population group	Number of cities	Veterinarians				Inspectors			
		Number	Maximum salary	Minimum salary	Average salary	Number	Maximum salary	Minimum salary	Average salary
I.....	6	24	3,000	1,620	2,120	97	3,300	1,200	1,860
II.....	11	36	2,700	1,200	1,860	70	2,400	1,200	1,640
III.....	25	16	3,540	1,500	2,040	54	2,100	1,320	1,590
IV.....	13	3	2,260	1,800	1,990	18	2,100	900	1,460
All.....	55	79	3,540	1,200	1,970	239	3,300	900	1,710

The average salary paid veterinarians on this work was \$1,970, with a range from \$1,200 to \$3,540. On the whole the size of the city seems to have had very little effect upon the average pay of a veterinarian.

The average salary paid inspectors on food control was \$1,710, and the range was from \$900 to \$3,300. The average pay of inspectors decreased as the size of the city decreased.

LEGAL PROVISIONS

Scope and adequacy.—Most cities are provided with legal means, through both statutes and local ordinances or health-department regulations, for the control of food. Such provisions generally cover the sanitary conditions of premises where food is manufactured, stored, or sold, the methods of handling foodstuffs, and the condition of the food. Adulteration and misbranding of food are in some places looked after by State and Federal agencies, the latter only in case of interstate shipments. Some cities rely upon local ordinances alone for their food-control authority.

Without attempting, at this time, to review the more recent ordinances or regulations that have been adopted for food-control purposes, a brief reference to some of them and a few samples of the comments or opinions obtained from the local authorities at the time of the survey will serve to indicate the general status of law-enforcement provisions.

New York City reported additional restrictions upon shellfish intended for sale in that city. Among other regulatory provisions, this health-department regulation provided that shellfish, except from approved sources, shall not be brought into or offered for sale in that city. Bacterial standards for shellfish were established in accordance with the numerical system adopted by the American Public Health Association for rating shellfish for *B. coli*. Recently an additional restriction prohibited the removal of shellfish from waters within the city without a permit from the city health department. A permit was also required for the handling of shellfish for other than food purposes, the containers to be plainly marked "shellfish for bait, and not for human food purposes."

The covering of foodstuffs with "newspaper or with any other paper previously used for any other purpose" is prohibited in a regulation adopted by the health department of Washington, D. C. This restriction applies to food not ordinarily cooked, peeled, or washed before being eaten. The city of Philadelphia has also regulated against the use of such paper coverings, the regulation prohibiting "the custom of wrapping meats or fish in old newspapers

or any wrapping paper that is soiled or that has been used for any other purpose."

The legal provisions in force were considered reasonably adequate for the purpose in most cities. Denver reported no legal provisions except a few health-department regulations which are apparently inadequate. Camden's legal requirements appear to be too complicated to be effective. Revision of the food ordinances of Harrisburg and Kansas City, Kans., was reported as desirable. In Newark they appear to be satisfactory except that the penalties provided seem too low. Toledo considered its code deficient as regards the examination of food handlers and the absence of post-mortem inspection of animals. Schenectady's ordinance needs modernizing. South Bend had no sufficiently stringent provisions. In Wichita an ordinance was being prepared. Five other cities (Baltimore, Houston, Trenton, Manchester, St. Joseph) reported that legal provisions were inadequate.

Enforcement.—Nearly one-half of the cities reported their food ordinances well enforced; 17 considered their enforcement fair; for 29 no statement of the degree of enforcement was obtained; and only 4 admitted it to be lax or poor. In St. Louis, Knoxville, and Peoria enforcement was reported to be as good as possible with the personnel available.

A considerable variety of procedures is employed for the enforcement of the food laws. Nearly all cities condemn foodstuffs considered unfit to eat. In 1923, 60 cities in addition to condemning foods also prosecuted violators, with, on the whole, a high percentage of convictions, resulting usually in fines. Eleven of these cities⁹ also revoked the licenses or permits of some, if not all, violators. In Harrisburg, Salt Lake City, Tacoma, and Youngstown there was no prosecution of offenders in 1923, but foods were condemned and a number of licenses and permits revoked. Omaha and Fort Wayne reported that violators were prosecuted, but these two cities did not condemn any food or revoke any licenses. Among the cities which condemned food but did not prosecute offenders or revoke licenses are Evansville, which "enforces by educational methods," and San Diego, where it was claimed that "no prosecutions are now necessary."

There were six cities in 1923 where neither prosecutions, condemnations of food (other than meat), or revocation of licenses were resorted to: Jersey City and Rochester, which did not report what other means, if any, were employed for law enforcement; Birmingham, which was educating dealers in regard to the require-

⁹ Chicago, Cleveland, New York, Newark, Portland, Erie, Fort Worth (no licenses or permits issued, but 59 places closed in 1923), Kansas City, Kans., St. Paul, Lawrence, Sioux City.

ments of the recently enacted food ordinance and planning to start enforcing it soon; Reading, which depended on its placard system; Syracuse, which reported "not much need for enforcement"; Utica, where there was no control over foods other than meat. No information concerning enforcement procedure was obtained for Albany, Wilmington, and Troy.

Prosecutions of persons violating food laws were conducted by State authorities in Canton (the State is advised of violations), Fort Wayne, Paterson, and Sioux City (where the State issues licenses).

The nature of violations prosecuted was manifold. The most common violations consisted of insanitary condition of premises, sale of unwholesome food, adulteration, and exposure of foods. In Cleveland 90 per cent were sanitary violations, and 10 per cent adulterations. New York's 21,685 prosecutions (in 1922) were divided as follows: Exposing food to contamination, 48 per cent; unclean premises, 16 per cent; improper cleansing of utensils, 15 per cent; sale of unwholesome foods, 5 per cent; all others, 16 per cent.

The number of prosecutions for violation of food laws in 1923 averaged over 10 per 100,000 population for all cities giving this information except New York. Three-fourths of these resulted in convictions. New York in this regard was in a class by itself, with a record of 14,388 prosecutions (242 per 100,000 population), or over five times as many as all other cities combined, and convictions amounting to 98 per cent of the total. For this reason New York is not included in the following table. It will be seen that while the number of prosecutions per 100,000 is above the average in the larger cities, the percentage of convictions is below the average only in the group of largest cities.

TABLE V.—*Prosecutions for violations of food laws, 82 cities, 1923*

Population group	Number cities reporting	Total population	Prosecutions		Per cent convictions
			Number	Per 100,000 population	
I ¹	10	10,792,176	1,300	12.0	57
II	16	5,589,138	751	13.4	92
III	39	5,635,716	439	7.8	98
IV	17	1,486,557	51	3.5	88
All	² 82	23,503,587	2,541	10.8	75

¹ Not including New York (see text).

² Including 31 cities reporting "none."

The number of dealers prosecuted is not a true measure of the effectiveness of the work. Warning first offenders, constructive criticism of bad practices, and condemnation of products are often

sufficient. The power to prosecute is a valuable weapon, but only in extreme cases does it appear necessary or profitable to prosecute or to revoke licenses.

Condemned food products are rendered unfit for human consumption by denaturing with kerosene, by tanking, and other procedures, and eventually disposed of by garbaging, incineration, dumping, rendering, or transfer to fertilizer plants. Knoxville either destroys such products or marks and returns them to the shipper. In Los Angeles and Kansas City, Kans., some of the condemned foodstuffs are fed to hogs.

Licenses and permits.—It is impossible to determine from the survey reports any definite distinction between licenses and permits. It is doubtful, in some cases, whether the health officer makes any distinction, for what would elsewhere be called a permit is in certain places reported as a license. Permits are usually, but not always, reported as issued by the health department. Licenses, on the other hand, are quite often issued by some other municipal department or official. Perhaps the most frequent point of divergence is the charging of a fee for licenses and not for permits, but even this procedure is not invariably followed. A permit is issued in some places as a preliminary or temporary license. In certain cities licenses are merely a source of revenue. The health officer can more readily revoke a health-department permit than a license issued by some other city official.

Licenses for handling or selling one or many kinds of foods (other than milk) were reported as issued in 61 cities in 1923. In 26¹⁰ of these they were issued by the city health department; in 7¹¹ by some other municipal agency with the approval of the health department; in 22 by some other municipal department or official alone; in 4 only State licenses are issued; and the issuing agency was not recorded for Detroit and Bridgeport. No food licenses were issued in 36 cities, while for Albany, Troy, and Utica there was no information on this subject. In 3 of the cities issuing no licenses, substitutes were required, as follows: In Syracuse, registration with the health department; in Paterson, approval card posted on premises; in Knoxville, certificate of inspection by the health department.

In 22 cities licenses were required for the sale of all foods, but most cities issued licenses only to certain types of establishments, the most common being restaurants, bakeries, meat markets, slaughterhouses, and peddlers in the order named.

¹⁰ Boston, Philadelphia, San Francisco, Jersey City, Portland, Akron, Cambridge, Dallas, Erie, Fall River, Hartford, New Bedford, New Haven, Norfolk, Omaha, Richmond, St. Paul, Spokane, Yonkers, Fort Wayne, Bayonne, Harrisburg, Lawrence, Manchester, Somerville, Waterbury.

¹¹ Chicago, Cleveland, Indianapolis, Atlanta, Camden, Memphis, El Paso.

License fees vary considerably for different cities and for different types of establishments. Seven cities charged no fee.¹² In the others it ranged from 50 cents to \$100.

Permits for the sale of food were reported as required in only 38 cities. In 28¹³ of these they were issued by the health department; in 6 by some other municipal agency; in Boston and Tacoma by other city officials after approval by the health department; and for Louisville and Syracuse the issuing agency was not stated. No information on food permits was given in the case of Albany, Utica, and Troy. The remaining 59 cities issued no permits for food, though some of these required permits for handling milk.

The types of food establishments for which permits were required vary widely, as in the case of licenses, the most common being slaughterhouses, ice-cream places, meat markets, bakeries, and restaurants. Very few cities issued permits to all food dealers.

Fees are charged for food permits in very few cities. Cincinnati charges 50 cents for a semiannual meat permit; Dayton \$1 for annual permits; San Diego's fee was \$2. There is no record of any others.

FOOD-INSPECTION SERVICE

Food inspection usually embraces the sanitary condition of premises, the method of handling, the condition of the food, and the cleanliness of equipment and utensils. The inspection of carcasses is omitted here, but will be considered separately under meat inspection. In the great majority of cities all, or nearly all, food-handling establishments are inspected by the health department. Comparatively few cities inspect only certain types of food places.

Thus 67 health departments reported the inspection of all establishments, including hotels, restaurants, soda fountains, fruit stands, bakeries, groceries, meat markets, slaughterhouses (except those under State and Federal supervision), and in some cities commission merchants, ice-cream plants, fish and oyster houses, confectioners, peddlers, and others. Only six¹⁴ of these definitely stated that food-manufacturing plants were inspected as well as retailers, but in all probability many others followed the same procedure. In 10 cities¹⁵ all establishments except hotels were visited by the health-department inspectors; in 5¹⁶ all except fruit stands; in Detroit, Elizabeth, and Washington, all except soda fountains and fruit stands. Troy and Lowell inspected only groceries and meat mar-

¹² Dallas, Erie, Hartford, Kansas City, Mo., Manchester, Norfolk, Waterbury.

¹³ Buffalo, Detroit, New York, Cincinnati, Jersey City, New Orleans, Seattle, Washington, Akron, Dayton, Houston, Lynn, Memphis, New Bedford, Oakland, Omaha, Paterson, Salt Lake City, San Antonio, Trenton, Yonkers, Allentown, Bayonne, Lawrence, Manchester, San Diego, Savannah, South Bend.

¹⁴ Boston, Canton, El Paso, Knoxville, Milwaukee, Minneapolis.

¹⁵ Camden, Dayton, Flint, Fort Wayne, Harrisburg, Paterson, Peoria, San Diego, Wichita, Youngstown.

¹⁶ Atlanta, Indianapolis, Newark, Schenectady, Sioux City.

kets. Albany and Utica covered only meat markets and slaughterhouses. No information regarding places visited is at hand for Fort Worth, St. Joseph, and Wilkes-Barre. The remaining eight cities followed various other procedures.¹⁷

All establishments were not inspected with equal frequency. In some cities new or substandard places were reinspected more often than others. While many cities made inspections periodically, some inspected irregularly or on complaint only. The inspection interval ranged from daily to annual or longer. Cities differed widely in the type of establishments most frequently inspected. Slaughterhouses usually received the greatest attention, in many cases daily. Meat markets come next with daily to semiannual inspections, averaging 70 inspections per year for those reported. Restaurants, groceries, and bakeries ranged from weekly to annual inspections, with an average of 22 per year. Soda fountains, fruit stands, and hotels were generally inspected at monthly to annual intervals.

In Table VI the 100 cities surveyed are listed according to the frequency of inspection of food premises. Wherever possible the average number of inspections per year per establishment is shown either as reported or as estimated from the information in the schedules.

TABLE VI.—*Frequency of inspection of food establishments in 100 cities, 1923 (estimated average number of times per year)*

Times per year	Number of cities	Cities
1-----	1	Jersey City.
2-----	8	Cleveland, Elizabeth, Paterson, Providence, Richmond, ^a Fort Wayne, Schenectady, Waterbury.
3 to 5-----	14	Boston, Chicago, Buffalo, New York, St. Louis, San Francisco, Seattle, Dallas, Flint, Grand Rapids, St. Paul, Trenton, Allentown, Harrisburg.
6 to 10-----	19	Baltimore, Detroit, ^b Pittsburgh, Cincinnati, Milwaukee, Newark, New Orleans, Portland, Atlanta, Erie, Fall River, Memphis, Reading, Salt Lake City, Spokane, El Paso, Manchester, San Diego, ^c Wichita.
11 to 20---	20	Los Angeles, Columbus, Kansas City, Mo., Louisville, Washington, Albany, ^d Des Moines, Duluth, Hartford, Houston, Jacksonville, New Haven, Norfolk, Oakland, San Antonio, Tacoma, Youngstown, Bayonne, Sioux City, South Bend.
21 to 50---	1	Savannah (47). ^e
No data---	25	Indianapolis, Toledo, Camden, Dayton, Fort Worth, Kansas City, Kans., Lowell, Lynn, Nashville, New Bedford, Oklahoma City, Omaha, Scranton, Springfield, Syracuse, Tulsa, Utica, Wilmington, Worcester, Yonkers, Canton, Evansville, Knoxville, St. Joseph, Troy.
Other <i>f</i> ---	12	See footnote <i>f</i> .

^a Except slaughterhouses which are inspected daily.

^b Groceries only on complaint.

^c Annually, reinspection on complaint.

^d Only slaughterhouses and meat markets inspected.

^e Slaughterhouses 3 to 4 per week, groceries and meat markets biweekly, others every 11 days.

^f Philadelphia, Akron, Peoria, often as possible; Denver, Minneapolis, irregular; Rochester, irregular except bakeries monthly; Birmingham, slaughterhouses daily, meat markets 1 to 3 per week, others not stated; Bridgeport, on complaint only; Cambridge, restaurants, soda fountains, and fruit stands irregular, bakeries weekly, others semiweekly; Lawrence, restaurants weekly, bakeries annually, others daily; Somerville, manufacturers monthly, restaurants and slaughterhouses weekly, others not stated; Wilkes-Barre, infrequently.

¹⁷ Syracuse inspected restaurants, soda fountains, bakeries; Tulsa, markets and stores; Wilmington, restaurants, markets, slaughterhouses; Manchester, all places except hotels and soda fountains; Buffalo, all except soda fountains; South Bend, all except slaughterhouses; Los Angeles, fruit stands, bakeries, meat markets, slaughterhouses; Rochester, restaurants, bakeries, meat markets, slaughterhouses.

Table VII indicates the volume of inspection work on food establishments in 89 cities for which information is at hand, arranged according to population groups.

TABLE VII.—*Number of inspections of food establishments per man and per 100,000 population, 89 cities, 1923*

Population group	Number of cities	Total number of inspections	Inspections per inspector and veterinarian	Inspections per 100,000 population
I.....	12	1, 090, 738	3, 450	6, 280
II.....	16	515, 599	2, 220	9, 230
III ¹	42	540, 214	2, 810	8, 680
IV ²	19	123, 185	3, 080	7, 380
All cities.....	89	2, 269, 736	2, 930	7, 550

¹ Exclusive of Birmingham, Cambridge, New Bedford, Springfield, Syracuse, Tulsa, Utica, Wilmington.

² Exclusive of Lawrence, Troy, Wilkes-Barre.

These figures would indicate a larger average number of inspections per man (i. e., inspectors and veterinarians) in cities of Group I than in any of the other groups. However, both whole-time and part-time personnel have been included, and in consideration of the low ratio of part-time to whole-time personnel in Group I and the high ratio in Group IV, it seems likely that more inspections were made per man, in proportion to time devoted, in cities of the last group than in those of the first. In general, a whole-time food inspector may be expected to make over 3,000 inspections per year, and a part-time man proportionately less. The number of inspections per 100,000 population is highest in Group II and lowest in Group I, but the variation as between groups is probably not significant.

In this connection it is interesting to compare the data in Table VII with a similar table in the report of the committee on the survey of 83 cities in 1920.¹⁸ In 1920, the average number of inspections per inspector and veterinarian for 55 cities was 2,253. In the survey made in 1924, this average was 2,930, an increase of approximately 680 per inspector, or about 30 per cent.

In 1920 an average of 4,464 inspections per 100,000 population was reported for 58 cities. In 1923 this average as reported shows a very considerable increase of approximately 65 per cent, or an average of 7,350 inspections for 89 cities. If the basic data obtained for the two survey years, 1920 and 1923, are equally reliable, there appears to have been a decided increase in the average number of inspections per inspector and especially per unit of population. The record for 1923 contains 31 cities not included in the table prepared for 1920 and it is possible that the work in these cities

¹⁸ Public Health Bulletin No. 136, p. 185, Table III.

raised the average. The figures given are quantitative and do not express or indicate the quality of the service or the effectiveness of supervision.

SCORING

A great diversity of practice existed in regard to the types of food-handling establishments scored and the frequency of scoring. Probably not over one-fourth of the premises inspected by the health departments were scored, although nearly one-half the cities in the present study scored one or more types of places.

All varieties of food-handling establishments were reported scored in 18 cities.¹⁹ Of these Cleveland scored 60 per cent of all such premises; Camden and Kansas City, Mo., did not score but used inspection forms; and Newark scored restaurants but used inspection cards on bakeries and other places. Restaurants alone were reported as scored in Portland, Des Moines, Yonkers, and El Paso. All premises except slaughterhouses were scored in Cincinnati, Paterson, and Savannah. Only restaurants and bakeries were scored in Detroit and New Haven, in the latter bakeries being scored by the State. Flint and Tacoma scored restaurants, bakeries, groceries, and meat markets. Fort Wayne scored restaurants, meat markets, groceries, and ice-cream plants; while Lynn scored bottling plants in addition. Fourteen other cities practiced scoring, but no two of these scored the same kinds of establishments.²⁰ Syracuse reported an attempt toward scoring. In Birmingham and Manchester scoring was about to start at the time of the surveys. For Albany, Utica, and Troy no information regarding scoring is at hand.

To summarize, restaurants were scored in 44 cities, bakeries in 34, meat markets in 32, groceries in 31, soda fountains in 28, hotels in 26, fruit stands in 24, slaughterhouses in 22, confectioners in 12, bottling plants in 12, and ice-cream factories in 11.

Many cities obtained newspaper publicity on their food-control activities, but only five²¹ actually reported that scores were published. El Paso and Savannah reported that scores were posted on the premises. Jersey City and Paterson issued clean-shop certificates, which were posted. A few cities publish these scores in their weekly or monthly bulletins or annual reports.

There is very little evidence at hand in respect to the real value of the publicity that may be obtained by publishing or displaying

¹⁹ Baltimore, Boston, Chicago, Cleveland, New York, Pittsburgh, Camden, Cambridge, Dallas, Erie, Kansas City, Kans., Memphis, Oklahoma City, Newark, Minneapolis, Canton, Knoxville, Kansas City, Mo.

²⁰ St. Louis, San Francisco, Indianapolis, New Orleans, Sioux City, Seattle, Dayton, Duluth, Jacksonville, Norfolk, Springfield, Richmond, Spokane, Wichita.

²¹ Portland, Seattle, Duluth, New Haven, Oklahoma City.

the scores given to food establishments. During the World War, in the extra cantonment zones, the scoring of food establishments in many instances proved a very effective means of improving the general status of these places. The cooperation of proprietors and the public as well was usually secured, and patronage by the personnel of Army camps and naval bases was quite effectively controlled by the activities of military police. In ordinary times it is probably more difficult to attract the public's attention to the significance of scoring or the display of certificates.

The method usually adopted in scoring is based upon certain standards of methods and equipment, and if these requirements or restrictions are reasonable scoring may prove an effective means of improving general sanitary conditions in food establishments. A high score is a definite objective that makes an appeal to some individuals, but, unfortunately, the true significance of high grades or scores is not universally recognized.

While some cities²² scored food establishments at every inspection, according to the information obtained, it was probably more frequently undertaken at every other inspection or even at greater intervals. In Table VIII the 48 cities which in 1923 reported the scoring of all or some of their food-handling premises are tabulated according to the reported frequency of scoring.

TABLE VIII.—*Frequency of scoring of food establishments, 48 cities, 1923*

Times per year	Number of cities	Cities
104.....	1	Des Moines.
52.....	2	New Orleans, Savannah.
24.....	1	Yonkers.
12.....	7	Portland, Camden, Jacksonville, Memphis, Norfolk, Oakland, Sioux City.
6.....	4	Cincinnati, Baltimore (average), Pittsburgh (average), Flint (3 to 12 per year).
4.....	3	Newark, Dallas, Duluth.
3.....	1	New York.
2.....	8	Chicago, Detroit, San Francisco, Seattle, Kansas City, Kans., Paterson, Spokane, Wichita.
1 to 2.....	1	Fort Wayne.
1.....	5	Dayton, Erie, New Haven, Canton, El Paso.
Irregular..	11	Boston (as necessary), Cleveland, St. Louis, Kansas City, Mo., Minneapolis (several), Akron (every 2 or 3 inspections), Cambridge, Lynn, Oklahoma City, Richmond, Tacoma.
No data..	4	Indianapolis, Springfield, Syracuse, Knoxville.

MEDICAL EXAMINATION OF FOOD HANDLERS

In 5 of the 12 cities in the first group there were either no regulations requiring any examination of food handlers or, as in the case of Pittsburgh, it was definitely stated that they were not enforced. In 38 of the remaining 88 cities no record was obtained of regulations calling for this work. From 3 cities there was no report.

²² Baltimore, New York, Pittsburgh, Cincinnati, Dallas, Norfolk, Paterson, Savannah, and a few others.

In 43 cities this activity was not considered as a profitable health department requirement, but in some of them, without regulations, examinations were made in special cases, and these enter into the tables given below. In the 54 cities which took some action there was considerable variation in the scope and the methods employed although the records are fragmentary. The diseases concerned are the ordinary infectious diseases, tuberculosis, venereal diseases, and certain skin diseases, the last being offensive to the senses rather than of sanitary importance. A yearly, semiannual, or even monthly physical examination would obviously be of no value against the acute infectious diseases, and consequently only contacts of known cases were ordinarily examined or excluded from work. The major efforts were directed against tuberculosis and venereal diseases.

No attempt has been made to review the laws or regulations intended to regulate food handlers. Many of these regulations are designed to prohibit the employment of persons suffering from communicable diseases, as indicated by a regulation adopted in Camden, which provides that "no person suffering from a communicable disease shall be employed in any capacity in any restaurant," and, further, that every person so employed shall secure a certificate from a physician or the health officer to the effect that he is "free from a communicable disease." This regulation also provides that "no person who has been afflicted with typhoid fever within three years shall be employed in a restaurant until it has been definitely determined that such person is not a typhoid carrier."

In Newark a certificate showing freedom from communicable disease was required, but this does not apply to persons handling meats or any foodstuff ordinarily cooked or peeled before consumption or inclosed in cans or other receptacles. The medical certificate required in El Paso prescribes an examination "within one week prior to the time of such employment." Dayton had a regulation which permitted the health officer to exclude from employment any person "found to be uncleanly."

The character of the medical examination performed in 48 cities for which this information was obtained varied, as shown by the following:

	Number of cities
Complete physical examination-----	18
For tuberculosis only-----	19
For venereal diseases only-----	6
Skin, tuberculosis, and venereal disease-----	3
Laboratory examinations only-----	1
Superficial examination-----	1

Examinations of food handlers were conducted by the health department in 18 cities, and either by the health department, city

physician, or some "reputable" private physician in 31 cities, there being no definite information for the other 5 cities.

For 56 cities information was obtained as to the persons examined, according to the following list:

	Number of cities
Food handlers in general-----	31
Only on suspicion or complaint-----	14
New employees -----	3
Restaurant employees only-----	3
Bakery employees only-----	3
Only persons exposed to known case-----	2

The frequency of examination as reported for 36 cities varied from an annual examination in 10 cities, twice each year in 21, "every 90 days" in 1, and reported as "irregular," "occasionally," "on complaint," or "in special cases" in 4 cities.

There was no information collected to indicate the number of persons employed in food establishments.

In 24 cities with populations varying from 98,400 to 536,718, a total of 136,288 medical examinations of food handlers was reported in 1923, according to the information contained in the survey records, with an average of 5,678 per city, or 2,725 per 100,000 population. The reports for these cities do not show how many persons were examined one or more times so that figures expressing total examinations do not indicate how effectively such a regulation is enforced or what constitutes an approach to any reasonable basis of the number of examinations required to realize the intent of such a regulation.

The largest number of examinations recorded in the surveys for 1923 was for Portland, Oreg., a total of 32,691, under a regulation requiring examinations twice each year by private physicians. In Savannah, where food handlers were examined occasionally for tuberculosis or syphilis and for special reasons, a total of only 30 examinations was reported.

In San Antonio, where the examination of food handlers was required to be conducted by the health officer or his assistant, a fee of 50 cents was charged. The fees for these examinations charged by private physicians vary, although the present surveys do not contain this information.

The practice of requiring periodic examination of food handlers undoubtedly possesses a possible educational value although this aspect of the procedure appears not to have been given serious consideration as a rule.

Opinions as to the relative value of medical examinations of food handlers as a health department procedure appear to vary. In his review ²³ of the report of the survey of 86 smaller cities, conducted in

²³ Survey of 86 cities, a review by Haven Emerson. A. J. P. H., November, 1925, pp. 998-9.

1924 by the American Child Health Association, Haven Emerson expressed his view as follows: "It is a satisfaction to find that only 18 of the 86 small cities have taken up the almost profitless health hobby of examining food handlers."

In presenting a proposed plan for an "ideal" health department for a city of 100,000 population, based upon the surveys of 83 cities in 1920, Winslow and Harris²⁴ provide for regular systematic medical examinations of all persons handling food for public consumption or milk to be sold raw or after pasteurization. These authors concluded that "the practical value of such work has not yet been demonstrated, but it is included here since the practice is already so general."

Action taken in regard to infected persons.—Some data were obtained from 72 cities. In 71 cities it was reported that infected individuals were excluded from food handling as long as they were in a communicable stage. One other city reported no action taken.

This exclusion from work in some instances calls for indirect work on the part of the health department. In Massachusetts, for example, a case of venereal disease is not legally reportable by name to the health authorities unless incorrigible, hence a food handler having a venereal infection and attending to treatment can hardly be officially registered and excluded from work, but he must be tactfully persuaded into some other temporary employment. In cases of other communicable diseases, they are, of course, quarantined by the health department and upon release certified for return to work.

In Scranton it was reported that any proprietor is liable to a fine if he employs a noncertified case of communicable disease.

STERILIZATION OF UTENSILS

From any standpoint, proper care and cleanliness of all utensils and accessories offered to patrons of public eating places is most desirable. It makes a strong appeal to some imaginations, and many health departments have endeavored to minimize this possible health hazard by adopting regulations that require the sterilization of such utensils as are used in public eating places.

Health-department supervision over eating places is concerned with inspection of premises, methods of preparation, and quality of food served, cleanliness of utensils, and medical examination of employees. From purely aesthetic considerations, all of these procedures are desirable and usually regarded as necessary. There is very little reliable evidence, however, in respect to the actual inci-

²⁴ Public Health Bulletin No. 136, pp. 253-254.

dence of infections contracted in public eating places. The demonstration of bacteria on eating or drinking utensils by laboratory procedures suggests a potential, if not real, source of danger in carelessly cleaned utensils.

Attempts to secure effective sterilization of eating utensils in public places has resulted in a variety of requirements intended to accomplish the greatest possible degree of cleansing that might be reasonably expected. The majority of cities have adopted regulations for this purpose and in some instances elaborate specifications prescribing the method to be used, degree of heat required, kinds of chemicals to be used, the mechanical devices permitted or required, the prohibition of chipped or cracked dishes or glassware, the optional use of paper cups at soda fountains, and other so-called individual containers that are intended to be used but once.

While many cities have adopted rather extensive regulations covering the sterilization of utensils, there is sometimes, and perhaps rather frequently, a failure to provide the necessary inspection service or machinery required for their effective enforcement. Extreme measures that entail undue expense on the part of the management of eating places are unreasonable and usually unwarranted and create, perhaps, a tendency to attempt to evade such regulations or to obey only sufficiently to avoid detection.

The sterilization of utensils in public eating places, where even forks, spoons, and glasses do not pass immediately from mouth to mouth might be considered more esthetic than sanitary in importance. At soda fountains and soft-drink establishments, where patronage is frequent and where quarters and facilities are crowded and supplies of cleaned utensils often limited, the problem of sterilization is of sanitary importance and very often difficult to attain. In view of the sanitary safety of the individual paper cup, it is perhaps astonishing to find that it was reported as a definite requirement in only one of the 100 large cities (Scranton) and as an alternative in only three instances (Akron, El Paso, and Philadelphia). Paper cups were undoubtedly used in a number of other cities in this group, although they may not have been required or mentioned by regulations.

Judging from the records of the survey made in 1924, it would appear that all but 13 of the cities studied had adopted some sort of regulations covering the sterilization of utensils in eating places. For several cities no record was obtained, and in a number of instances, although required, the method prescribed was not mentioned.

Of the methods prescribed in those cities giving information upon this subject, sterilization by steam or by boiling or hot water appears to be the most common requirement. The use of chemicals, alkalies,

or soap is sometimes required. The methods adopted in the cities reporting on this item are shown in Table IX, grouped in three different classes in order to indicate the variety of procedures prescribed for general purposes and for eating places and soda fountains.

TABLE IX.—*Requirements for sterilization of utensils—number of cities with specified requirements, classified to indicate their application*

	No record	Not required	Required, method not specified	Steam ¹	Boiling water ²	Hot water	Washing	Heat	Chemicals ³	Special equipment ⁴	Paper cups
General requirement...	13	15	33	13	9	12	1	1	2	1	-----
Eating places specified.	5	13	31	12	13	18	2	1	2	3	-----
Soda fountains specified.....	6	18	29	11	9	19	3	1	1	2	1

¹ Steam, with or without other requirements.

² Boiling water, sometimes includes addition of soap, alkali, or chemical.

³ Chemicals include "antiseptic solutions, soaps, and alkalies."

⁴ Special equipment refers to approved washing machines.

Some of the difficulties encountered in attempting to secure adequate cleansing of utensils are perhaps reflected in the variety of procedures prescribed in the regulations promulgated in different cities. In Norfolk a regulation was adopted that permitted the use of "boiling water, hot air, or live steam." In an ordinance passed in Knoxville mechanical cleansing is required, to be followed by rinsing and boiling in clean water for a period of not less than 5 minutes; if live steam is used, utensils must be dried by live steam in closed containers, under 10 pounds of pressure for at least 15 minutes; if dry heat is used, a temperature of 356° F. for at least 1 hour. A temperature of 230° F. for a period of 5 minutes is required in a regulation passed in Dayton or the alternative of using an antiseptic solution approved by the health department.

PROTECTION OF FOOD DISPLAYS

The display of food commodities has a selling value. It interests the health officer, especially when food is exposed to contamination from any possible source, such as flies, dust, promiscuous handling, and the occasional trespass of small animals and rodents. Sidewalk display was formerly a more common practice than it is at the present time in many sections. The corner fruit stand and hole-in-the-wall stalls are still to be seen in many cities. In public markets fresh fruits, vegetables, meats, and fish are frequently displayed without any effective protection.

In some States (Mississippi for example) a regulation of the State health department prohibits the exposure of foodstuffs either

upon sidewalks or within the stores, especially food that is to be eaten without further cooking. Various restrictions have been prescribed in different cities for the purpose of preventing or minimizing the opportunities of contaminating food that is not protected by suitable containers. These restrictions have been applied to fruit, vegetable, and grocery stores, markets, and public eating places. The use of screening is a common practice, although its effectiveness is often doubtful or obviously nil.

As a possible danger to health the importance of preventing the contamination of exposed food has, perhaps, been exaggerated at times, but common decency demands a reasonable protection of all food intended for human use. There has been in recent years a very considerable improvement in the manner in which food commodities are displayed or offered for sale, although much is left to be desired, especially as regards the smaller dealers and itinerant vendors.

In stores.—On this item of food displays records are available for 92 of the 100 cities surveyed in 1924. Five cities reported no requirements (Baltimore, Rochester, St. Joseph, South Bend, Wilmington). Reports from other cities indicate that 41 cities required some protection but no specifications were given. Forty-four cities required "covering," either glass or screens. Five prescribed protection for specified food, "all food to be eaten raw" (Jersey City); "all prepared foods" (Fort Wayne and Milwaukee); "cooked foods and those to be eaten raw" (Atlanta); "screen or glass for cooked foods" (Jacksonville). Three cities required fans (Los Angeles, Oakland, Savannah). At least one city required "elevation from the floor" (Tacoma).

On sidewalks.—Of 97 cities reporting on this item for 1923, 8 mentioned no requirements (Atlanta, Baltimore, Denver, Detroit, St. Joseph, San Diego, Wilmington, Youngstown). In 19 cities²⁵ sidewalk displays were prohibited. Forty-seven cities required some protection; of these 16 gave no specifications, 31 required either glass, screens, "covering," or fly nets.

Elevation from the sidewalk was mentioned in the reports for 32 cities—12 inches in 1, 14 inches in 1, 18 inches in 17, 2 feet in 7, 3 feet in 3.

In the regulations of 15 cities recorded in the surveys restrictions concerning sidewalk displays specified certain classes of foods, as, for example: "No foods which are to be eaten raw or unpeeled," "no meats," "fruit only," "only nuts and fruit with nonedible skin

²⁵ Akron, Allentown, Birmingham, Dayton, El Paso, Evansville, Fort Worth, Grand Rapids, Minneapolis, Newark, Oakland, Reading, Rochester, St. Louis, St. Paul, San Antonio, San Francisco, Springfield, Wichita.

or covering," "no baked or cooked food," "only fruits and vegetables that require cooking."

SPECIAL ACTIVITIES

Seventeen cities reported special activities carried on under the food division of the health department, usually some activity of particular local importance. Washington, D. C., reported that special attention was given to restaurants and lunch rooms on account of heavy transient and tourist patronage. Richmond had inaugurated a sampling and testing program for control of its oyster industry. Because of recent attention directed toward the danger of consuming contaminated shellfish, a number of coastal cities have been forced to consider more seriously the sanitary regulation of the shellfish industry. On account of possible invasion by plague, Oakland reported a special program directed toward the extermination of rodents and roaches in eating places.

Aside from these more or less unusual special activities, a number of cities have given particular attention to some of the more common phases of food-control activities, such as medical examination of food handlers and the scoring or grading of eating places, and occasionally analytical examinations for quality, adulteration, etc.

Cooperation with other agencies.—The quality of many foodstuffs offered for sale at stores or markets, or consumed in public eating places, is influenced by the supervision exercised by Federal and State authorities. The activities of the municipal authorities usually begin where those of the Federal and State agencies end. Wherever the interstate and intrastate supervision is active and effective, local authorities, concerned directly with intramural conditions, are relieved of considerable responsibility. Because of the increasingly enormous quantities of foodstuffs now being shipped in interstate traffic, the operations of Federal authorities under the pure food and meat inspection laws have improved the quality of these food items and at the same time relieved the local communities of much of the responsibility and expense of maintaining the necessary supervision over foods originating outside the State.

It is to the interest of local authorities to cooperate with both State and Federal agencies in securing compliance with the pure food and meat inspection laws. Many States and municipal regulations embody the essential requirements of these Federal laws, and violations detected locally are often prosecuted through Federal courts.

In some States most of the analytical examinations of foodstuffs are conducted by the State authorities, although in a few cities much of the work of the division of food control is occupied with food examination and laboratory analysis. Spoilage, adulteration, and mis-

branding of food after it reaches a city is not unknown and an eternal vigilance on the part of local health authorities is necessary in order to minimize the possibility of accidental or intentional contamination or manipulation of foodstuffs that originally passed Federal or State inspections.

Only 10 cities²⁶ for 1923 reported any lack of cooperation with Federal and State authorities in their efforts to control the quality of food supplies. (No report from 15 cities.) In 33 cities the records for 1923 indicate cooperation with State authorities, 3 with Federal authorities, 26 with both, and 2 with "other" agencies. In the remaining 11 cities cooperation with other agencies existed, as evidenced by the replies "good," "high," and "yes."

Publicity.—The value of publicity in health work is rated differently by different observers and varies for different items. Some health authorities seek full publicity to encourage those complying with and discourage those violating food-control regulations. In some instances this is accomplished by publishing or posting scores or grades on the premises or by full newspaper notoriety for court cases. In other cities the effect of publicity is apparently considered as out of all proportion to the offense and publicity is resorted to only in case of incorrigible violators.

For 21 cities there was no record obtained concerning publicity in food-control work. Twenty-four cities reported that no use was made of publicity. Twenty-eight cities reported the use of publicity as "yes," "little," "occasional," or "restricted." Twenty-seven cities used publicity freely, through the press, the posting of scores, and by means of lectures. In seven cities²⁷ the scores or certificates of conditions found were published or posted on the premises.

MEAT INSPECTION

Since the passage of the Federal meat inspection law of 1906, a more or less uniform system of meat inspection has been adopted by nearly all States and larger cities. Producers, packers, and consumers are frequently widely separated, so that Federal responsibility for the condition of meat and meat food products destined for interstate trade was logical and indeed necessary. Much of the meat sold and condemned wholly within a State is often Federal inspected as it is not practicable to make this distinction in establishments requiring Federal inspection.

Adequate State supervision over the quality and condition of all meat and meat food products intended for use within the State, including slaughtering and the manufacturing and sale of these

²⁶ Akron, Bridgeport, Camden, Canton, Reading, Salt Lake City, Tulsa, Wilmington, Yonkers, Youngstown.

²⁷ Scores reported as published in Duluth, Oklahoma City, Portland, Seattle; posted in El Paso, New Haven, Savannah.

commodities, is undoubtedly desirable. Wherever this inspection service is not provided by the State, local authorities should assume this responsibility.

The recognition of spoiled meat that is actually injurious or dangerous to health is often difficult. Obviously, any meat or meat products that have become decomposed, putrid, offensive, or objectionable to the senses should be condemned and destroyed, although it is doubtful if much meat in this condition would be consumed.

Food poisoning, often called "ptomaine poisoning," has been classified as (1) food infection, and (2) food intoxication. Food infections are due to *B. enteriditis* and show a mortality rarely over 1 per cent. Of the food intoxications, due to the effect of toxins, botulism represents but one variety, with a mortality varying from 50 to 100 per cent. Botulism may result from poisoning by meat sausage as well as from beans, olives, etc. For many cases of food poisoning, home processing is frequently at fault. Comparatively few outbreaks of food poisoning have been reported in the United States. In its prevention, food, when eaten, must be clean and fresh, and here enters the need for adequate refrigeration facilities. Processing methods must be satisfactory. The ultimate safeguard, however, lies in proper methods adopted for cooking.

Meat inspection is intended to protect the health and rights of customers and consumers. It has, therefore, both sanitary and economic aspects. Inspection before and after slaughtering also becomes a valuable means of discovering certain diseases of cattle that otherwise might not have been detected. The principal functions that are served by a meat-inspection service are the following:

1. To supervise slaughtering, manufacturing, handling, etc.
2. To eliminate diseased or spoiled meat or meat food products.
3. To prevent the use of injurious preservatives, dyes, etc.
4. To prevent misbranding or misleading labels or statements.
5. To protect the health and rights of purchasers and consumers.

Inspection service maintained at slaughtering establishments requires the employment of qualified veterinarians who are capable of detecting the presence of disease or conditions harmful to health, such as tuberculosis, anthrax, hog cholera, tape-worm cysts, and septic and pyemic conditions that may produce meat poisonings. Such an inspection service should create as little waste as possible consistent with reasonable protection against harmful lesions or conditions.

It has been the custom in many cities to prohibit the sale or use of "bob veal" or the flesh of calves less than from 3 to 4 weeks old at time of slaughter, although reliable evidence appears to indicate that veal of this age is not objectionable or harmful from a purely health standpoint.

Tuberculosis is probably not very often contracted from the ingestion of meat from tubercular cattle, although carcasses containing

gross lesions of bovine tuberculosis are withdrawn from trade. The tuberculin testing of dairy cattle is intended to minimize the danger of spreading bovine tuberculosis to infants through milk supplies, and supervision over this important safeguard appears to be a proper function of the veterinarians employed in the milk and food divisions of municipal health departments.

Organization.—Meat inspection by municipal authorities is usually a function of the division of food control of the health department, as shown by the reports from the large cities. In 48 of these 100 cities meat inspection in 1923 was carried on as a part of the activities of a division of food inspection which included milk and dairy inspection. In 23 cities it was organized as a part of a division of food control which did not include milk inspection. In 6 cities meat inspection was reported as organized under the division of laboratories, which usually included milk and food inspection. In 15 cities it was placed in the sanitary division or a division given general inspectorial supervision, including at times both milk and food. There appeared to be no systematic organization in force in 5 cities, although some provision was made for meat inspection, the inspectors usually being more or less responsible directly to the health officer or central administrative offices. In only 3 cities (Denver, Newark, and Portland) does it appear to have been organized as a distinctly separate division or department.

In a majority of these cities, therefore, there was a more or less definite organization established for meat inspection, usually as a subdivision of a bureau or division placed in control of all milk and food inspection. In some cities it appears to be rather distinctly organized, while in others the records do not indicate a separate functional organization. Meat markets and stores are often inspected by the regular food inspectors and the supervision over slaughtering constitutes frequently a rather distinct activity not combined with other duties of general food inspection.

Personnel.—The personnel engaged in the inspection of meats includes veterinarians and lay inspectors. The chief duty of the veterinarians is the inspection and supervision over slaughtering, while lay inspectors are assigned to the sanitary inspection of places where meat is offered for sale. In the reports of the 100 cities covering the year 1923, the records of personnel are frequently segregated with those detailed to the general main division or department in which the meat-inspection service is organized, so that it is not usually possible to classify those engaged only on meat inspection.

In a number of cities both veterinary and lay inspectors are assigned to inspections that cover milk, food, meat, and general sanitation of premises. Both whole and part time veterinarians

are also employed, and it is frequently impossible, from the available records, to establish any reliable division of time that could definitely be charged solely to meat inspection.

In the report of 63 cities there appeared no record of the employment of veterinarians for meat inspection. In 6 other cities whole-time veterinarians were on duty, but gave only part of their time to food inspection, including meats, and 5 other cities employed part-time veterinarians. The remaining 26 cities, or approximately one-fourth, reported the employment of whole-time veterinarians for meat inspection, varying from 1 (Boston) to 12 (Detroit) per city, or an average of approximately 1 per 116,780 population.

In this connection it should be noted that while a majority of these cities reported that some inspection of slaughtering was carried on by the health department in 1923, only 37 per cent of the entire group employed veterinarians for this important function.

In Massachusetts all inspectors of slaughtering (except in Boston) must receive the approval of the State department of public health before appointment. Approximately 500 such inspectors are appointed by cities and towns and approved by the State authorities each year.

Expenditures.—Because of the fact that items of expenditures made to defray the cost of meat inspections are not often segregated in the records obtained from the cities embraced in the present study, it is possible to set forth the cost of this activity in only a relatively small group of cities. This item is frequently included in the budget or records of the sums appropriated or allotted to food inspection, or to the allotment made for laboratories or general sanitary inspection.

TABLE X.—*Expenditures for meat inspection, 11 cities, 1923; per cent of total budget and of allotment for food control*

City	Total health department expenditures ¹	Expended for food control ² (including meat inspection)	Expenditures for meat inspection		
			Total expended	Per cent of total expenditure	Per cent of allotment for food control
Cincinnati.....	\$129,845.00	\$22,364.00	\$14,314.00	11.0	64.0
Denver.....	94,420.00	23,988.00	17,748.00	18.7	73.9
Des Moines.....	50,294.05	7,820.00	3,980.00	7.9	50.9
Houston.....	79,864.94	11,320.00	5,380.00	6.7	47.5
Indianapolis.....	148,957.34	15,610.00	8,700.00	5.8	55.7
Louisville.....	82,636.09	-----	17,129.04	20.7	-----
Newark.....	299,389.51	-----	17,759.75	5.9	-----
Oakland.....	120,136.00	40,347.00	26,223.55	21.8	64.9
Philadelphia.....	646,932.00	-----	14,612.64	2.3	-----
Portland.....	89,218.59	33,948.71	11,267.07	12.6	33.2
San Francisco.....	289,197.66	51,574.77	35,265.77	12.2	68.4
Averages.....	-----	-----	-----	12.2	58.9

¹ Total health department expenditures used here do not include expenditures for hospitals and medical relief to poor, items which are not common to all cities.

² Expenditures in this column are those made for food control, exclusive of milk, but including meat inspection.

In only 11 cities (Table X) was it possible to determine fairly definitely the cost of meat inspection. In these 11 cities an average of 12.2 per cent of the total health department expenditure was allotted to meat inspection, this percentage varying from 2.3 per cent for Philadelphia to as high as 20.7 per cent in the case of Louisville. The data for Oakland indicates an expenditure of 21.8 per cent of the total budget for this activity. It was reported, however, that approximately 75 per cent of this expenditure was returned to the city treasury. Deducting this revenue, Oakland expended for meat inspection 6.5 per cent of the total health department net expenditure.

For 9 cities in Table X, the expenditures for food inspection, exclusive of milk, but including meat inspection, is shown. In this small group of cities, approximately 59 per cent of the allotment for foods other than milk is expended for meat inspection. Oakland spends about 30 per cent of its entire health department appropriation for food control activities in addition to the expenditure made for milk inspection, and of this allotment for foods nearly 65 per cent is spent for meat inspection. In commenting upon this relatively high allotment to food and meat control in Oakland, the surveyor and local health officer both expressed the conviction that the allotment made for this activity was disproportionately large in comparison with other activities of equal or greater relative importance.

While the data in respect to the cost of meat inspection are obviously very meager, Table X probably represents the extreme variations that might be expected in other cities in this group. In 8 cities included in this table (excluding Louisville, Newark, and Philadelphia), the average expenditure for food control, including meat inspection, was 8.7 cents per capita, as compared with an average of 5.5 cents per capita for 33 cities covered in the previous survey of 1920. For the 11 cities the average expenditure for meat inspection alone was 2.4 cents per capita, varying from 0.7 cents in Philadelphia to 6.6 cents in Louisville.

In the "ideal" health department organization, proposed by Winslow and Harris,²⁸ the total budgetary allotment set aside for food control, exclusive of milk, was \$5,100, or 2.6 per cent of the total budget, not including hospital expenditures. In the present study, in the 11 cities for which the data is available, and with the exception of Philadelphia, the expenditure for meat inspection appears to have been from 2 to 10 times higher than the allotment considered a reasonable provision in terms of the proposed "ideal" organization.

²⁸ Public Health Bulletin No. 136.

It would require more detailed study of local conditions and circumstances in order to determine whether or not meat inspection had been allotted a disproportionate percentage of the total budget in the 11 cities included in Table X. If this general average obtains for the other cities in the present study, the conclusion that too large an allotment is usually made for meat inspection might be justifiable.

SCOPE OF ACTIVITIES

In presenting a functional classification of activities included in the practice of the group of cities now being studied, there are usually included under meat inspection the three following types of service:

1. General sanitary inspection.
2. Examination of animals before and after slaughtering.
3. Inspection of meat and meat products offered for sale.

1. *General sanitary inspection*.—In the activity classified as meat inspection there is frequently included general sanitary inspections of premises where animals are slaughtered, the methods and equipment used, and the physical examinations of employees. These inspections are conducted, in some instances, by the veterinary or lay meat inspectors or by the inspection force assigned to the divisions of food inspection or general sanitary inspections. Data available are insufficient to indicate the frequency of such inspections. The reports received indicate that in those cities where a meat-inspection service is definitely organized, general inspections are made by these inspectors. Otherwise such supervision as is maintained over slaughtering establishments is carried on through the food or sanitary divisions.

2. *Examination of animals before and after slaughtering*.—The majority of the 100 large cities (probably over 80 per cent) appear to have made some provisions for the inspection of slaughtering, although only 37 cities reported that veterinarians were employed for this purpose. The records are incomplete as to the number of cities in which Federal or State inspection is maintained over slaughtering. According to the reports received, there are no slaughterhouses, and consequently no inspection of cattle slaughtering required in 4 cities,²⁹ and no inspection of slaughtering is provided by any agency in 5 other cities.³⁰ In 8 cities³¹ there is no municipal supervision of cattle slaughtering, this work being done

²⁹ Bayonne, Minneapolis, Paterson, Providence.

³⁰ Akron, Grand Rapids (sanitary inspection only), Canton, Schenectady (sanitary inspection only), South Bend.

³¹ New York, Dallas, Kansas City, Kans., Tulsa, Harrisburg, St. Joseph, Wichita, Spokane.

by Federal or State authorities. On the other hand, municipal inspectors supervise all the slaughtering in 10 cities,³² no record being given of Federal or State supervision in these cities.

Municipal regulations governing the slaughtering of animals intended as human food usually require the presence of the designated inspectors at the time of slaughtering. A considerable proportion of such inspections is apparently performed by lay inspectors. There is no reliable or complete record of the percentage of animals slaughtered under Federal or State supervision in the cities under consideration, so that the quantity of meat sold without any inspection can not even be estimated.

In New York City there is no special divisional organization for meat inspection. All slaughtering establishments in this city are under Federal supervision. The inspection of meats at wholesale markets and retail stores is conducted by the regular food inspectors and all animals not killed under Federal supervision are inspected and a fee charged for this service.

Local regulations governing slaughtering do not always provide for continuous inspections of all local slaughtering establishments. The inspector is not always required to examine each animal before it is killed or to view each carcass at time of slaughter and before any portion is removed or offered for sale. He is sometimes called only when the diseased condition of a carcass is obvious to the slaughterer or dealer. Lay inspectors may not be qualified to detect disease or to decide upon the proper disposal of doubtful conditions.

Even when adequate authority exists, municipal supervision over slaughtering, dressed meats, and retail stores handling meats has been reported as lax and inadequate because of insufficient funds or incompetence or indifference of inspectors. During a canvass of the trade it was found that in several instances less than half of the total number of retail meat stores were included among those subjected to inspection, and many of the small slaughterhouses were found to be not only insanitary but filthy.³³

Condemnations.—The number of carcasses inspected by municipal meat-inspection services was reported for 49 cities. The number per city varied within rather wide limits from 1,399 in New Bedford and 5,862 in Jacksonville to 898,000 in Los Angeles and 1,365,551 in Baltimore, the number reported depending largely upon local conditions.

The percentage of carcasses reported as condemned as unfit for human food or for other reasons also varied, ranging from none out

³² Cambridge, Camden, Fall River, Hartford, Oakland, San Antonio, Syracuse, Utica, Yonkers, Youngstown.

³³ See "Retail Marketing of Meats," by Herbert C. Marshall, Bul. No. 1317, p. 35, Department of Agriculture.

of 360,000 slaughtered in St. Louis and 0.01 per cent in Oklahoma City to 2.15 per cent in New Bedford and 4.34 per cent in Camden, with an average of 0.38 per cent of all carcasses inspected. The 49 cities reporting gave a total of 8,204,468 carcasses inspected and 31,414 condemned. The number of condemnations made by Federal or State agents was rarely given. In Seattle 385,934 carcasses were inspected by Federal authorities, and 2,407 or 0.6 per cent of these were condemned. The bulk of the inspections performed in St. Louis was conducted under State and municipal supervision. The relatively high percentage of condemnations in Camden might indicate a poor quality of meat received in that city or an unusually high rate of condemnation.

Of the total number of carcass inspections made by municipal agencies in 1923 (50 cities), nearly 62 per cent were reported by cities in Group I, 21 per cent in Group II, 13 per cent in Group III, and only 4 per cent in Group IV. Condemnation averages in these four groups varied according to the following percentages: 0.28, 0.43, 0.60, and 0.27, respectively. It would appear that proportionately more cattle are slaughtered in the larger cities of Groups I and II than in the smaller cities of Group III. (Only 6 cities of Group IV reported inspections by local authorities.) This may indicate that a better grade of animals is offered in the larger cities, where local slaughtering may more nearly supply the demand than in the smaller cities which probably, as a rule, receive much of their meat from interstate shipments. The larger cities appear to employ a relatively larger proportion of whole-time veterinarian inspectors who are undoubtedly better qualified to accept, as edible, parts of carcasses that lay inspectors might condemn entirely.

Disposal of condemned carcasses.—Various methods are used to dispose of carcasses or parts of carcasses that have been condemned as unfit for human consumption. The multiplicity of methods reported indicate that this is usually a local problem depending, in part at least, upon facilities available for the disposal of garbage and other perishable wastes. In cities with numerous packing industries, special provisions for the disposal of condemned carcasses may be necessary.

There is no record of the method followed in 18 of the cities covered by this survey. In the remaining cities one or more of the following methods were reported, the frequency indicated by the figures used: Denatured 25, tanked 24, rendered 16, made into fertilizer 12, incinerated 10, destroyed 9, all or part added to garbage and fed to hogs 4, public dump 2, buried 1, and returned to shipper 1.

In 22 cities, two or more of these methods were permitted or required. Denaturing included the practice of sprinkling or covering with kerosene, cresol, or other solutions which would render the condemned material inedible. Meat that is tanked, rendered, or made into fertilizer is effectively eliminated as food. In several instances where condemned material was reported as "destroyed" the method was not given. In 4 cities (Boston, St. Louis, Washington, D. C., and Flint) condemned portions were allowed to be added to garbage and fed to hogs. In Bayonne (after denaturing) and Kansas City, Mo., condemned meat was reported as "put on public dump." Burial is the method reported by Bridgeport. Camden reported that condemned meat was destroyed by denaturing with kerosene although no legal authority existed for this procedure.

3. *Inspection of meat offered for sale.*—Municipal supervision over the sale of meat and meat food products offered for sale in retail stores and markets is frequently assigned to the divisional organization or personnel provided for general food-control purposes. In a few cities this supervision is conducted by a separate division of meat inspection which includes slaughtering as well.

The inspection of meat and meat products in the retail trade is necessary to detect decomposition or contamination or other signs of unfitness that have arisen after the meat has passed inspection at time of slaughtering or manufacture. This inspection or supervision is generally considered essential in order to protect the interests of the consumers from the carelessness, indifference, or neglect of unscrupulous dealers.

This inspection commonly includes also a sanitary examination of the premises where meat is offered for sale, the equipment and methods of handling, means of protection against contamination by insects, animals, or human beings, the presence or absence of the indelible stamp or mark of previous inspection, and the physical or medical examination of employees.

In the majority of cities studied, veterinarians are not usually detailed to this phase of meat inspection as it does not appear to demand a high degree of technical training. Consequently, lay inspectors of the food division are often assigned to this work in connection with other duties relative to food control.

Meat inspection has undoubtedly certain æsthetic and economic aspects that deserve consideration, in spite of the fact that the bulk of meat and meat-food products are sterilized by cooking before they are eaten. Rigid supervision over the quality of these products at the time of sale will not guarantee absolute freedom from the harmful consequences of improper cooking or home methods of processing. For this reason the importance of proper cooking and methods of preparation should be emphasized.

Table XII indicates the quantity of meat inspected in 11 cities reporting on this item. Detailed data for other cities were not reported.

TABLE XII.—*Pounds of meat inspected and condemned in 11 cities, 1923*

City	Pounds of meat		Per cent condemned
	Inspected	Condemned	
Seattle.....	56,800,000	122,729	0.22
St. Paul.....	7,500,000	22,932	.30
San Francisco.....	1,326,604	5,614	.42
Salt Lake City.....	2,132,560	17,311	.80
Oakland.....	13,017,144	17,488	1.34
New Orleans.....	1,478,883	30,126	2.03
Tacoma.....	718,000	32,666	4.60
Cincinnati.....	1,900,000	115,915	6.1
Birmingham.....	36,379	3,742	10.3
Memphis.....	89,100	12,072	13.5
Elizabeth.....	10,000	1,800	18.0
	86,008,670	382,495	.44

B. Drug Control

The necessity for supervision or regulation of the manufacture and sale of drugs, including narcotics, liquors, alcohol and alcoholic preparations, nostrums, patent and proprietary remedies, has been recognized by the passage of the Federal pure food and drugs act, the Harrison narcotic act, the eighteenth amendment to the Constitution regulating the sale of intoxicating drinks, and various State and municipal laws and ordinances intended to serve similar purposes.

Although attempts to enforce these various legal restrictions have encountered numerous obstacles, the general purity and quality of pharmaceutical preparations undoubtedly have been improved and it has become more difficult to dispense habit-forming drugs in the guise of patent medicines. Failure to effectively enforce these restrictions has usually been due to inadequate funds and personnel. There continues to-day an extraordinary sale of nostrums and so-called patent medicines, and enormous sums of money are spent annually for these alleged remedies and cures in the common practice of self-treatment.

It has been estimated that nearly 1 per cent of the total population of the United States are drug addicts, exclusive of the use of alcohol. Drug addiction becomes, therefore, an important public health problem, in addition to its sociological and economic aspects, although up to the present time its prevention has been largely a function of Federal and State authorities, with only occasionally a municipal activity.

Information and data concerning the efforts undertaken in the 100 large cities under the caption of drug control are very meager and incomplete in the reports of the survey conducted in 1924. In many instances, lack of detailed information indicates that very little is done by the municipal authorities and the records of Federal or State activities were not usually available or obtained.

Activities of Federal authorities.—No attempt was made usually, in the survey of 1924, to collect detailed information concerning Federal activities directed toward the control of drugs. From the reports received for 1923, however, it would appear that supervision over the sale of narcotics was exercised by Federal authorities fairly effectively in about 25 per cent of the 100 cities reporting. This supervision was recorded as "good" or "effective" in at least 10 cities.

In 61 cities, there was evidence of some activity by Federal authorities who are concerned, officially, with the manufacture and sale of drugs intended for interstate trade. In many of these cities apparently no definite action was taken by the local authorities. According to the reports received, supervision exercised by the Federal agencies was considered "inadequate," "ineffective," or "poor" in 10 cities although practically no evidence was submitted to substantiate such opinions.

No further data were recorded to warrant any discussion of the extent or effectiveness of the activities of Federal agencies engaged in the control of drugs.

Activities of State authorities.—Seven cities reported for 1923 no activities locally by State authorities. For 28 other cities, the schedule either contained no record or it was indicated that no record could be obtained. For the remaining 65 cities the activities of State authorities in local drug control measures were reported as inadequate or ineffective in 19; good, fairly complete or effective in 12; occasional in 2; and more or less active in 32.

In the absence of more definite information, no estimate of the extent or effectiveness of State supervision over drugs can be offered here. The general impression gained by reviewing the data and comments appearing in the survey records appears to indicate that very little was accomplished in at least half of these cities. Wherever municipal control appeared to have been inadequate or entirely lacking, the urgent needs of the situation were no doubt frequently met by the exercise of Federal or State jurisdiction. Occasional references to lack of adequate personnel indicated that State authorities were often handicapped by insufficient funds and personnel.

Municipal drug-control activities.—Judging from the information collected for 1923, none of the 100 large cities maintained any spe-

cial divisional organization assigned exclusively to the control of drugs. A number of cities used the designation "division of food and drugs," although practically no activities were directed toward supervision over drugs, even in those cities that had adopted specific ordinances or regulations designed to exercise certain jurisdiction over the sale of drugs, narcotics, alcoholic beverages, etc.

In only 22 of the 100 large cities was there any record whatever submitted for 1923 to indicate that the municipal authorities in these cities had made any effort to control or regulate the sale of drugs. In only one city (Cleveland) does it appear that any serious attempt was made in this direction. Five cities reported that some action was taken, but only on complaint and apparently very little was accomplished. In three cities, the police authorities exercised such control measures as were undertaken and in each instance the records indicate very little activity. In two other cities, the health department reported that an occasional analysis was made at the request of the police. One city reported a contract between the health department and a university by means of which a relatively small number of samples of drugs were analyzed. In nine cities such activities as were carried on by the municipal authorities were undertaken by the divisions designated as milk and food, food, or food and drugs; in one other by the division of sanitary inspection.

No record whatsoever appears in the schedules of 63 cities to indicate any action by the municipal authorities directed to the control of drugs. In these instances and in the remaining cities not included in the list of 22 cities mentioned in the preceding paragraph, some action by Federal or State authorities may have been taken. In some of these cities the activities of these agencies appears to have been satisfactory, so that the failure of municipal authorities to exercise jurisdiction over the drug traffic may have been due to the fact that they relied upon the Federal or State authorities for the necessary regulation of this traffic.

For the city of Cleveland the local control of drugs, as reported for 1923, was made a part of the bureau of laboratories. This functional division of the city health department, in addition to fulfilling the requirements of a public health laboratory, is charged with the control of foods (other than milk) including drugs. Drug-control activities, under the direction of the director of laboratories, were carried on by one whole-time and one part-time pharmaceutical chemist, utilizing equipment provided in the chemical laboratory. In 1923, \$4,900, or approximately 1 per cent of the total health-department expenditures, were charged to drug-control activities, which consisted of "routine field inspections" of narcotic and proprietary preparations. A total of 2,280 inspections was reported.

Prescription files and premises were examined, and during the year 1,626 samples were collected, 754 of these being subjected to standard analyses. Fifteen prosecutions by the local authorities were reported, and in addition 42 others in cooperation with State and Federal agencies, with a total of 13 convictions. Fines in these cases amounted to about \$2,000, and 1,867 packages were condemned and destroyed. Enforcement was stated to be fairly satisfactory.

Licenses.—Information concerning requirements as to licenses is very meager and does not indicate the extent to which they may be required. In some States drug stores and other establishments handling or dispensing drugs and various preparations are licensed by the State authorities. In Kansas City, Mo., the city license bureau requires occupational licenses for drug stores. The practice in the cities under consideration appears to vary, although in many cities no license appears to be required. When issued locally licenses are controlled by the health authorities in some cities, in others evidently by the police department, in Newark by the department of public safety.

Inspections.—Only a few cities reported any routine inspections of establishments or individuals handling drugs. In addition to Cleveland (*vide ante*), Milwaukee reported 118; Kansas City, Mo., and Memphis, once each month; New York City, periodic; and a few others on suspicion only or at irregular intervals. In Newark inspections were made whenever licenses were issued, from 15 to 18 each year.

Analyses and examinations.—Six cities out of the entire group reported the collection and analysis by the city health department of samples of various drugs and other preparations: Chicago, 3; Cleveland, 1,626; Kansas City, Mo. (number not given); Memphis, 110; Milwaukee, 31; Washington, spasmodically.

In New York City periodic inspections of drug stores were reported. General sanitary conditions are noted and samples of pharmaceuticals and drugs collected at regular intervals. The department of health requires the registration of all patent and proprietary preparations offered for sale in that city. There were 471 such preparations submitted for registration and of these 411 were approved and 60 refused pending changes in claims made.

Oakland reported that the health department laboratory made 45 analyses of drugs at the request of the local police authorities. In Philadelphia 537 similar analyses for the police department were recorded. In five other cities (St. Louis, San Francisco, Cincinnati, Oklahoma City, Sioux City) activities were confined to the use of the health department's laboratory facilities for the analysis of drugs, usually at the request of the police. In Boston, samples are sent to the laboratory of the State health department for analysis.

Prosecutions.—Information in respect to the number of prosecutions instituted for violations of local ordinances or regulations promulgated for drug control purposes is lacking for nearly all of the 100 cities. Cleveland reported 15; Newark, 2; Camden, 3 (by police department); Washington, D. C., “when justified.” For Boston, the police department reported 359 narcotic, 17 drug, and 3,464 prohibition violations in 1923. Information is lacking concerning the number of convictions of the quantities of various supplies condemned or destroyed.

C. General Summary and Conclusions

In all of the 100 large cities some provision was made in 1923 for the control of food supplies, these activities being carried on by the local health department. Only a few of these cities, however, exercised administrative control over drugs. The scope and extent of State activities varied. Federal authorities were concerned largely with meat inspection and drug control.

Food and drug control, usually combined, was a separate function in only 28 cities of the entire group; in only five of these as a distinctly organized bureau or division. In the remaining cities it was combined either with milk inspection or other allied activities and the director or chief, as well as certain subordinates, allocated their time to their various duties.

An average of two whole-time and one part-time personnel per 100,000 population (data for 62 cities) were engaged exclusively in food and drug control. There was an average of one veterinarian to four lay inspectors, although nearly one-half of the cities did not report the employment of any veterinarians for this work.

Approximately 4.5 cents per capita were expended in 1923 for the control of food (other than milk) and drugs, 93 per cent being for salaries. These expenditures varied from 16.8 cents per capita in Oakland to 0.8 cent in St. Louis. The average salary of veterinarians was \$1,970 and of the inspectors \$1,710.

In most cities the survey for 1923 indicated that reasonably adequate laws, ordinances, or regulations for food-control purposes had been promulgated. Food ordinances were reported as well enforced in only about one-half of the cities in this group. Enforcement procedures usually included condemnations; prosecutions of offenders in 60 cities; and revocation of licenses in a few instances. Prosecutions for violations of food laws in 1923 averaged 10 per 100,000 population for all cities reporting (except New York City). Convictions were secured for about 75 per cent of these.

Licenses were issued to all or certain types of food-handling establishments in 61 cities, in about one-half of these by or with the

approval of the local health department. Permits were issued to certain types of establishments in 38 cities, in most cases by the health department. Fees for licenses varied from 50 cents to \$100; for permits, from 50 cents to \$2.

In most cities all or nearly all food-handling establishments were inspected by local health authorities. The frequency of inspection varies widely in different cities and for different types of establishments, slaughtering houses usually receiving the greatest attention. Seven thousand three hundred and fifty inspections per annum per 100,000 population were reported for 1923 as compared with 4,464 in 1920. About 2,930 inspections per inspector were made during 1923 and only 2,253 in 1920.

Nearly one-half of these cities scored one or more types of food-handling places in 1923, although probably not over one-fourth of the total number of premises inspected were scored. The frequency of scoring varied from annual to semiweekly and also for different types of places. Restaurants were scored by more cities than were any other establishments. There was no evidence obtained that would indicate the relative value of scoring.

Medical examinations of all food handlers were required in 54 cities, the practice varying considerably in different cities. Only one-third of these cities required careful physical examinations, the major emphasis being placed upon tuberculosis and venereal diseases. The value of this practice does not seem to have been demonstrated. In 71 cities infected individuals, when discovered, were excluded from food-handling occupations while in a communicable stage. The required examinations were conducted by the health departments in 18 cities and in 31 others either by the health authorities, city physicians, or private physicians. The frequency of examinations varied from "annual" to "every 90 days," "occasionally required," or "in special cases." The information obtained in this survey did not indicate any reasonable basis for the frequency or character of examination that would be necessary to carry out the intent of this procedure.

Efforts to secure adequate sterilization of utensils used in public eating places have engaged the attention of many health authorities. All but 13 cities in this group reported regulations requiring sterilization of utensils used in restaurants and at soda fountains. Either steam or hot water was the usual process required. Many practical difficulties are involved in attempts to carry out this procedure, and lack of sufficient inspection service frequently prevents effective enforcement. There was very little uniformity in the methods of sterilization required.

Various devices intended to protect certain food displayed in stores or on sidewalks were specified, and nearly all cities required

some method of protecting displayed food. Sidewalk displays were prohibited in 19 cities. In a majority, however, this practice was permitted for certain kinds of food, provided they were reasonably protected, elevation above the sidewalk being a frequent requirement.

Meat inspection, or supervision over slaughtering and the manufacturing and retailing of meat and meat food products, has both sanitary and economic aspects. Supervision over the slaughtering and sale of meats consumed locally is a function of local health authorities. Meat-inspection service is organized as a distinct division of the local health department in only 3 of the 100 large cities. In the remaining cities in this group, it is combined with food and other activities. While 80 cities reported some inspection of slaughtering in 1923, only 37 employed veterinarians for this important work. Supervision over the retail trade in meats is usually exercised by the regular food inspectors.

Expenditures for meat-inspection service are not usually segregated. In 11 cities the cost of this inspection averaged 2.4 cents per capita. In a few cities, at least, the expenditure made for meat inspection appears to be disproportionately large in comparison with allotments made for other activities, as high as 20 per cent of the total health-department budget being devoted to meat inspection in at least one city (Louisville).

There is evidence at hand to indicate that a considerable quantity of meat and meat products are not subjected to inspection, either at time of slaughter or sale. This applies to municipal control over animals slaughtered for local or intrastate trade. This condition of affairs is due, largely perhaps, to inadequate personnel and lack of trained veterinary inspection service. The importance of meat inspection from a purely health standpoint is apparently subject to a divergence of opinions.

An average of less than one-half of 1 per cent of all carcasses inspected, including meat offered for sale, was reported as condemned because unfit for human consumption. Condemnations varied within very wide limits and apparently were not indicative of the thoroughness or effectiveness of the inspection service.

Rigid inspection of slaughtering and supervision over the quality of meats offered for sale will not guarantee absolute freedom from the possibility of disease transmission. Certain sanitary, economic, and aesthetic considerations are involved. There is obviously need of stressing the importance of proper cooking and methods of processing in the home.

Control over the sale of drugs in many cities is exercised by Federal or State authorities. Only 22 cities in the group under con-

sideration reported any attempt at drug control. A few cities issue licenses, conduct inspection, seize and analyze samples of various preparations, or undertake prosecution of offenders. Failures to effectively enforce regulations necessary for adequate control over the manufacture and sale of drugs have usually been due to inadequate funds and personnel. Drug addiction is an important public-health problem.

XVI. WATER SUPPLIES

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OWNERSHIP AND OPERATION

In 16 of the 100 cities surveyed in the spring of 1924 the public water supply was owned by private companies,¹ in two jointly by the municipality and the Metropolitan District Commission, a State agency,² in one (Washington) by the United States, and in the remaining 81 by the municipality itself.

Of the 81 municipally owned supplies, 20 were operated by a more or less independent water board or commissioner,³ 13 by the water department,⁴ and 53 by a bureau or division of water under some other city department or board or commissioner.

HISTORICAL DEVELOPMENT

Source.—For 4 of the 100 cities definite information was lacking as to when the present source of supply was adopted.⁵ Of those known the Trenton supply and part of the Philadelphia supply date back to 1801 and the others were reported as follows:

Date of installation

Period	Number of cities	Cities
1820-1839	7	Buffalo, Cincinnati, Detroit, Pittsburgh, Reading, St. Louis, Wilmington.
1840-1859	6	Boston, Bridgeport, Chicago, Cleveland, Harrisburg, Utica.
1860-1879	29	Albany, Cambridge, Canton, Denver, Erie, Evansville, Fall River, Fort Wayne, Hartford, Indianapolis, Kansas City, Mo., Louisville, Lynn, Manchester, Milwaukee, Minneapolis, New Haven, Oakland, Providence, Rochester, Salt Lake City, San Antonio, San Francisco, Scranton, Somerville, Waterbury, Wilkes-Barre, Worcester, Youngstown.
1880-1899	30	Allentown, Atlanta, Bayonne, Birmingham, Camden, Dallas, Des Moines, Duluth, Jacksonville, Kansas City, Kans., Knoxville, Lawrence, Lowell, Memphis, Nashville, Newark, New Bedford, Omaha, Paterson, Peoria, Portland, St. Joseph, St. Paul, Schenectady, Sioux City, South Bend, Spokane, Syracuse, Wichita, Yonkers.
1900-1909	11	Columbus, Dayton, Elizabeth, El Paso, Jersey City, Los Angeles, Oklahoma City, Richmond, Seattle, Troy, Washington.
1910-1919	11	Baltimore, Flint, Fort Worth, Grand Rapids, Norfolk, San Diego, Savannah, Springfield, Tacoma, Toledo, Tulsa.
1920-1923	0	

¹ Bayonne, Birmingham, Bridgeport, Elizabeth, Indianapolis, New Haven, Oakland, Paterson, Peoria, St. Joseph, San Antonio, San Francisco, Scranton, Utica, Wichita, Wilkes-Barre.

² Boston and Somerville; source by State, distribution system by municipality.

³ Baltimore, Cambridge, Denver, Detroit, Erie, Fall River, Flint, Hartford, Houston, Louisville, Lynn, Manchester, Memphis, New Bedford, St. Louis, St. Paul, Springfield, Tulsa, Wilmington, Worcester.

⁴ Atlanta, Cincinnati, Columbus, Dallas, Fort Worth, Los Angeles, Minneapolis, Salt Lake City, Savannah, Seattle, Sioux City, South Bend, Tacoma.

⁵ Akron, Houston, New Orleans, New York.

In many cases, however, other sources were added or the location of intakes was changed at a later date.

Treatment.—In most cases, particularly the older supplies, the water received no treatment until many years after the supply was installed. (As used here, the term “treatment” does not include disinfection or processes employed for other purposes than the improvement of the sanitary quality, which will be considered later.) In 43 of the 100 cities the public supply was still untreated, except for storage in impounding reservoirs in the case of 20 of them. Of the 57 receiving treatment the date of installation was not definitely known for one (Atlanta). The earliest treatment reported was begun in Kansas City, Mo., in 1875, and in other cities as follows:

Date of beginning of treatment

Decade	Number of cities	Cities
1880-1889	3	Denver, Oakland, Omaha.
1890-1899	6	Albany, Kansas City, Kans., Knoxville, Lawrence, St. Joseph.
1900-1909	22	Birmingham, Cincinnati, Columbus, Elizabeth, Harrisburg, Indianapolis, Jersey City, Louisville, Nashville, New Haven, New Orleans, Norfolk, Oklahoma City, Paterson, Pittsburgh, Providence, Reading, St. Louis, San Diego, Washington, Yonkers, Youngstown.
1910-1919	20	Akron, Baltimore, Bayonne, Cleveland, Dallas, Erie, Evansville, Flint, Fort Worth, Grand Rapids, Hartford, Minneapolis, Philadelphia, Richmond, Scranton, Springfield, Toledo, Trenton, Tulsa, Wilkes-Barre.
1920-1924	4	Cambridge, Detroit, Memphis, St. Paul.

In Buffalo treatment works were under construction. Many of the original plants had been or were being replaced, enlarged, or reconstructed.

Disinfection.—All but 18⁶ of the 100 public supplies were disinfected either constantly or in emergency, chlorine in some form being used everywhere except in Youngstown where the excess lime method was employed. The initial date of disinfection is not available for 6 cities.⁷ Knoxville claimed to have been the first to adopt chlorination, in 1894, but this is probably an error. In 14 cities it was begun during 1900-1909,⁸ in 53 during 1910-1919, and in 8 since 1920.⁹

The historical information available from the surveys is summarized in Figure 11.

⁶ Boston, Camden, El Paso, Fall River, Fort Wayne, Houston, Lowell, Lynn, Manchester, New Bedford, Portland, San Antonio, Sioux City, Somerville, Spokane, Springfield, Troy, Worcester.

⁷ Evansville, Oklahoma City, Rochester, Tulsa, Wichita, Wilkes-Barre.

⁸ Albany, Bridgeport, Columbus, Elizabeth, Harrisburg, Jersey City, Louisville, Nashville, New Orleans, Norfolk, St. Louis, Scranton, Waterbury, Youngstown.

⁹ Cambridge, Canton, Memphis, Peoria, Reading, San Francisco, Schenectady, Washington.

SUPERVISION BY HEALTH DEPARTMENT

The degree of control exercised by city health departments over public water supplies varied from the making of all analyses and supervision of protection to no supervision at all of either laboratory analysis or treatment.

Laboratory.—In 34 of the 100 cities the city health department had no connection whatever with analysis of the public water supply.

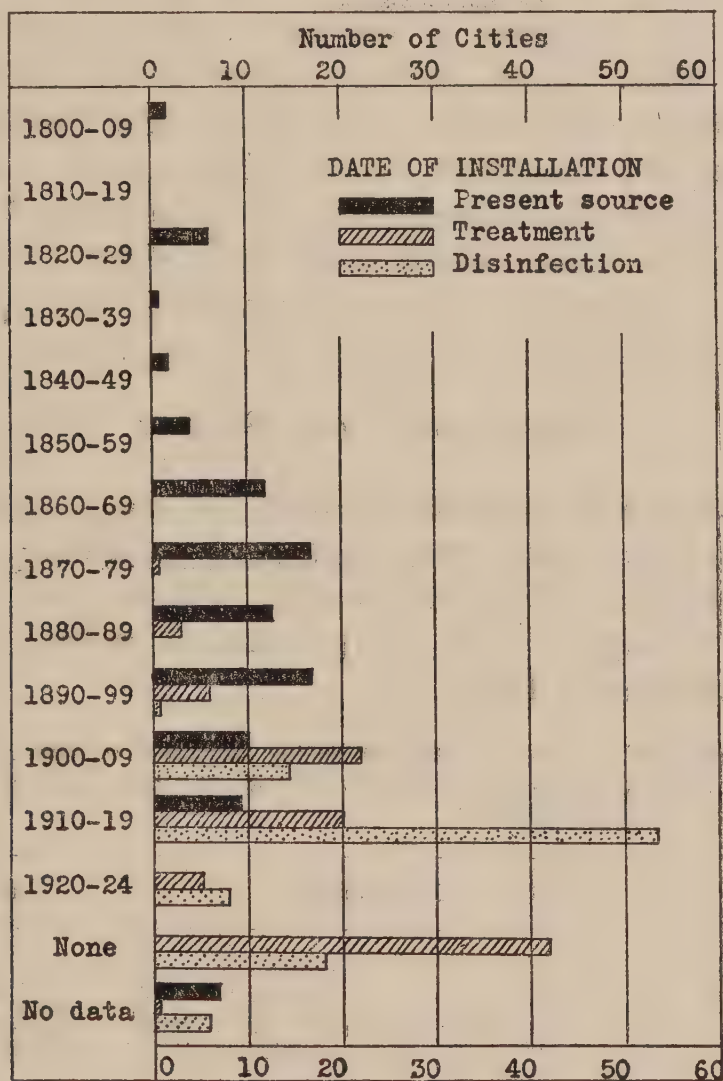


FIG. 11.—Summary for 100 cities, giving date of installation of present source of water supplies, treatment plants, and disinfection apparatus

In many of these, however, the State department of health exercised some control. Of the remaining 66 cities the city health department made all laboratory examinations in 25,¹⁰ made check analyses in 33,¹¹ and only received copies of the examinations in the other 8.¹²

¹⁰ Albany, Allentown, Canton, Chicago, Dayton, El Paso, Fort Wayne, Houston, Jacksonville, Nashville, Portland, Rochester, Salt Lake City, San Diego, San Francisco, Savannah, Schenectady, Seattle, Sioux City, South Bend, Spokane, Syracuse, Tacoma, Waterbury, Wichita.

¹¹ Atlanta, Baltimore, Birmingham, Bridgeport, Buffalo, Cincinnati, Cleveland, Columbus, Dallas, Des Moines, Detroit, Elizabeth, Indianapolis, Jersey City, Knoxville, Los Angeles, Memphis, Newark, New Orleans, New York, Norfolk, Oakland, Oklahoma City, Pittsburgh, Richmond, St. Joseph, St. Louis, Scranton, Toledo, Tulsa, Washington, Yonkers, Youngstown.

¹² Akron, Bayonne, Hartford, Kansas City (Mo.), Milwaukee, New Haven, Paterson, Philadelphia.

Of the 25 city health departments which made all the water analyses, 9 made examinations at least daily, 6 from two to three times per week,¹³ 7 weekly,¹⁴ 1 (El Paso) biweekly, and 2 (Portland and Spokane) monthly. Of the 33 health departments which ran check analyses, 16 made examinations at least daily, 4 from two to three times per week,¹⁵ 3 weekly,¹⁶ 1 (Newark) biweekly, 3 (Cleveland, Detroit, and Memphis) "frequently," and 6 "occasionally."¹⁷

Protection.—Active control in protecting the quality of the public water supply was exercised by the city health department in only 13 of the 100 cities. These included supervision of chlorination in Chicago, Cleveland, Milwaukee, Savannah, and Seattle; of watershed inspection and treatment in Norfolk; and of sanitary inspection and control of the watershed in the remaining 7.¹⁸ Probably many health departments which made laboratory analyses also advised the water authorities at times regarding treatment. In some cases the State department of health acted in an advisory capacity.

SOURCES OF PUBLIC SUPPLY

Surface waters were used exclusively in over two-thirds of the cities surveyed. The others were supplies from underground sources or from both surface and underground. The number of cities having each type of supply, with the population served,¹⁹ is shown by geographic divisions in Table I.

TABLE I.—Character of sources of public water supplies of the 100 largest cities of the United States by geographic divisions, showing the number of cities and consumers in each class

Division	Underground			Surface			
	Wells	Springs	Infiltration galleries	Open rivers	Impounded streams	Natural lakes	
						Large unprotected	Small protected
New England.....	1			1	11		3
Middle Atlantic.....	2	2		6	8	2	1
East North Central.....	5			7	2	3	
West North Central.....	2		1	6		1	
South Atlantic.....	2			2	3		1
East South Central.....	1			3	1		
West South Central.....	3			2	1		
Mountain.....					2		
Pacific.....	1				5		
Total number cities.....	17	2	1	27	33	6	5
Consumers.....	1,880,000	576,000	139,000	9,033,000	7,740,000	5,298,000	677,000
Per cent of total consumers.....	5.7	1.7	0.4	27.1	23.2	15.9	2.0

¹³ Houston, Salt Lake City, Schenectady, Seattle, South Bend, Wichita.
¹⁴ Fort Wayne, Rochester, San Diego, San Francisco, Savannah, Sioux City, Tacoma.
¹⁵ Columbus, Los Angeles, Richmond, St. Joseph.
¹⁶ Birmingham, Des Moines, Indianapolis.
¹⁷ Atlanta, Bridgeport, St. Louis, Toledo, Tulsa, Yonkers.
¹⁸ Hartford, Newark, New Haven, New York, Oakland, Salt Lake City, San Francisco.
¹⁹ Number of persons reported as using public supplies, not total population.

TABLE I.—*Character of sources of public water supplies of the 100 largest cities of the United States by geographic divisions, showing the number of cities and consumers in each class—Continued*

Division	Mixed			Total number of cities	Consumers	
	Wells and rivers	Under-ground and impounded	Lakes and wells		Number	Per cent of total
New England.....				16	2,936,000	8.8
Middle Atlantic.....		3		24	11,957,000	35.8
East North Central.....	1			18	8,271,000	24.8
West North Central.....			1	11	2,547,000	7.6
South Atlantic.....				8	2,084,000	6.2
East South Central.....				5	838,000	2.5
West South Central.....		1	1	8	1,416,000	4.3
Mountain.....				2	387,000	1.2
Pacific.....		2		8	2,942,000	8.8
Total number cities.....	1	6	2	100		
Consumers.....	237,000	7,355,000	443,000		33,378,000	
Per cent of total consumers.....	0.7	22.0	1.3			100.0

Character of source.—Of the 20 ground-water supplies, 2 (Allentown and Newark) were from springs, 1 (Des Moines) from infiltration galleries, and 17 from wells.²⁰ The 71 surface supplies included 27 from open rivers, 33 from impounded streams, 6 from large unprotected natural lakes, and 5 from small protected natural lakes. Of the 9 supplies from two or more mixed sources, 1 (Indianapolis) was from wells and rivers; 6 were from impounded and underground—1 spring (Reading), 1 wells and infiltration gallery (New York), and 4 wells,²¹ and 2 were from wells and natural lakes—1 large unprotected (Fort Worth), 1 small protected (St. Paul).

Consumers.—Of the 33,378,000 persons reported as using the public supplies in and around the 100 cities surveyed, 2,595,000 (7.8 per cent) used ground water, 22,748,000 (68.5 per cent) used surface water (open rivers 27.1 per cent, impounded streams 23.2 per cent, natural lakes 17.9 per cent), and 8,035,000 (24 per cent) used mixed surface and ground water.

Geographic distribution.—That the geographic location of a city, through its relationship with the topography and the geology of the surrounding country, influences to some extent the character of the source is likewise apparent from Table I. In New England all but one of the 16 supplies were from surface sources, 11 being from impounded streams. The greatest diversity of sources obtained in the Middle Atlantic States, where all types were represented²²; impounded streams and open rivers each supplied approximately one-fourth of the 24 cities, while the remaining cities were about

²⁰ For list of cities using each type of source, see footnotes to Table II.

²¹ Dallas, Elizabeth, Los Angeles, Oakland.

²² Infiltration galleries supplied a portion of New York City.

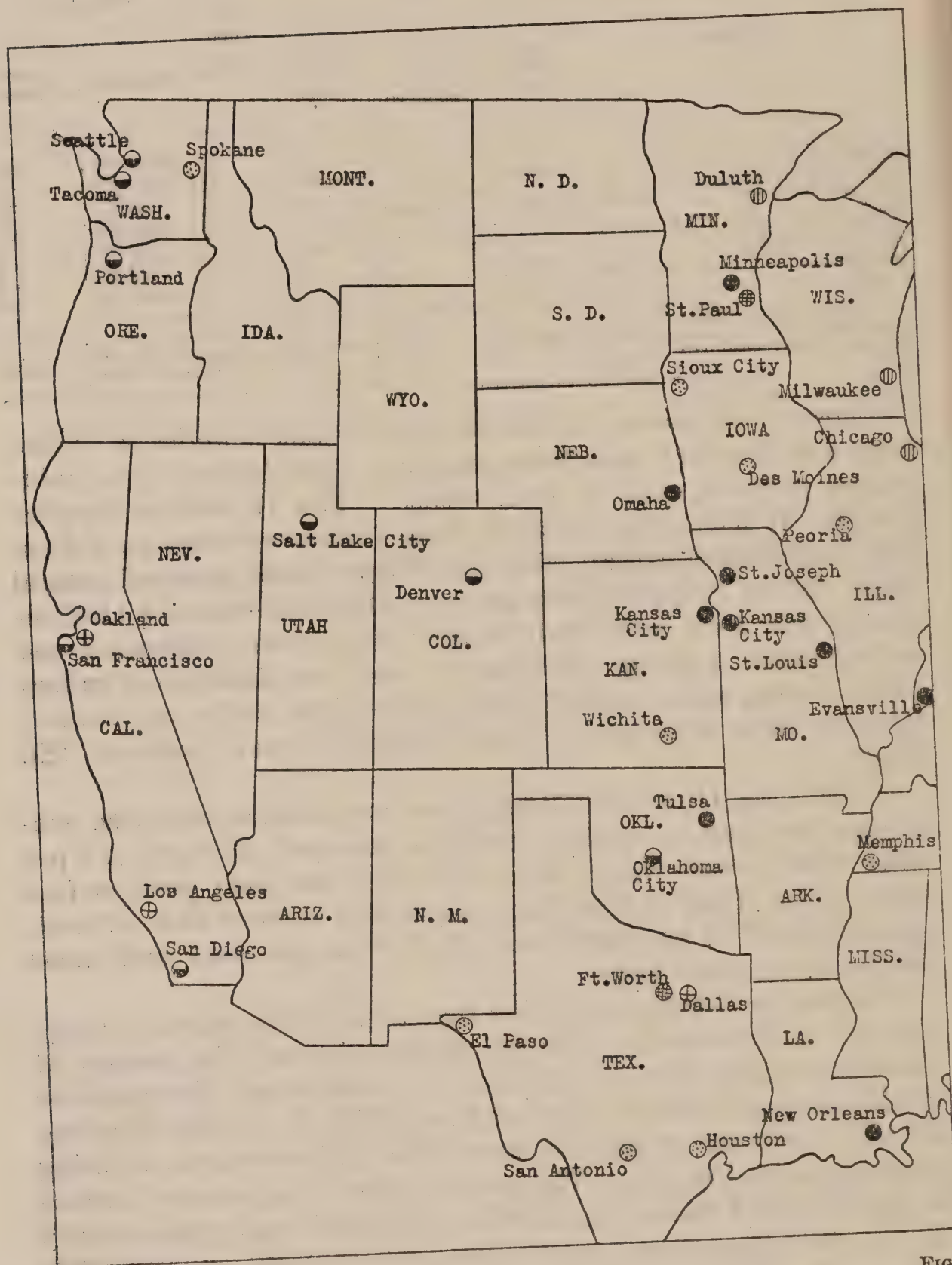
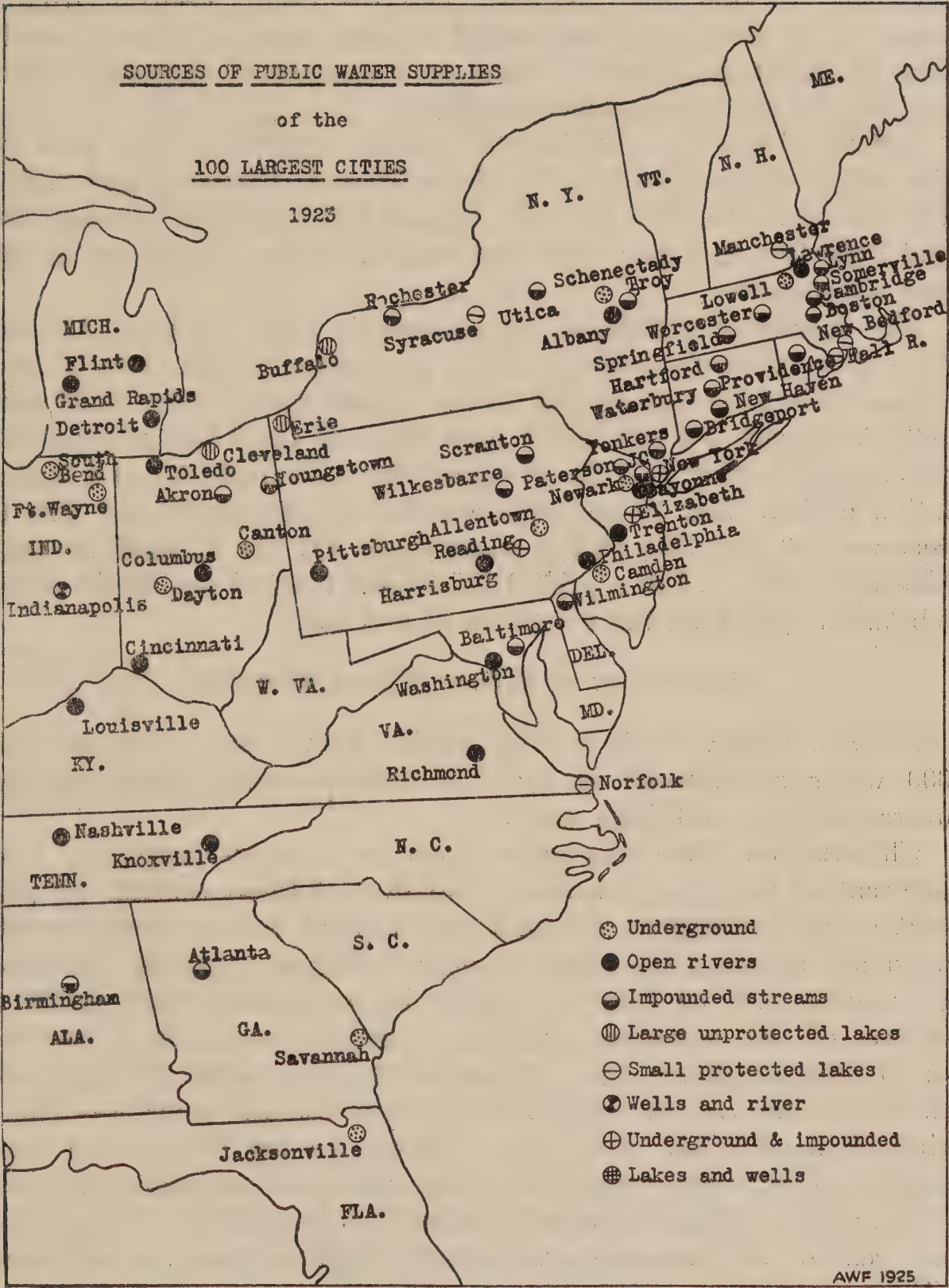


FIG.



equally divided among the other types. The North Central States contained most of the large natural lake supplies of the country, and were further characterized by the large proportion of river and well supplies with almost a complete absence of impounded streams. In the South Atlantic and the South Central groups open rivers, wells, and impounded streams were well represented. The Mountain and Pacific States used impounded streams almost entirely, except for a few well supplies.

Details of sources.—Of the well systems supplying all or part of the water consumed in 25 cities, the wells in 6 cities averaged under 100 feet in depth, in 9 between 100 and 500 feet, in 8 between 500 and 1,000 feet, in 1 over 1,000 feet, and in 1 (New York) the depth was not stated.

The density of population on watersheds varied widely. Of the 39 impounded watersheds 13 had a population of less than 10 per square mile, 5 between 10 and 25 per square mile, 7 between 25 and 100, 10 between 100 and 500, 1 over 500, and for 3 the information was not available.²³ Of the 28 open river watersheds, 5 had a population of less than 10 per square mile, 11 between 25 and 100, 6 between 100 and 500, and 6 unknown.²⁴ Of the 6 small natural lake watersheds, 2 had a population of less than 10 per square mile, 2 between 10 and 25, and 2 between 25 and 100.

PROTECTION OF PUBLIC WATER SUPPLIES

Major methods.—Only 8 cities, serving 2.7 per cent of the 33,378,000 water consumers²⁵ in the 100 cities surveyed, used entirely untreated water, all from wells.

Chlorination alone was relied upon by 14 cities supplying 15.8 per cent of the total consumers, and in 4 of these, serving 1.2 per cent of the consumers, chlorine was applied either intermittently or to only a part of the supply or only during emergencies. Storage (for three days or longer), usually in conjunction with sanitary control of the watershed, was the principal means of protection in 20 cities supplying 13.4 per cent of the consumers, and in 11 of these, serving 7.7 per cent of the consumers, the water was chlorinated in addition. Four cities, having 3.4 per cent of the consumers, relied upon coagulation, together with sedimentation and chlorination. Mixed treatments were used by 8 cities, serving 23.2 per cent of all consumers, to protect supplies from two or more different sources.

The remaining 46 cities, supplying 41.5 per cent of all consumers, employed filtration as the major treatment, in combination with

²³ Dallas, Paterson, Wilkes-Barre.

²⁴ Detroit, Harrisburg, Minneapolis, Richmond, Trenton, Tulsa.

²⁵ Actual consumers, not population.

other methods. Of these, 33 cities, serving 28.2 per cent of all consumers, relied chiefly upon rapid sand filtration (always with preliminary coagulation and detention), while the other 13 cities, containing 13.3 per cent of all consumers, depended principally upon slow sand filters.

Table II shows in greater detail the various combinations of methods used for treating water from different types of sources, together with the cities and consumers served.

TABLE II.—Means of protection of public water supplies of 100 largest cities of the United States, by character of sources, showing the number of cities in each class and the number of consumers *

Character of source	Slow sand filtration					Rapid sand filtration, with complete chlorination		
	Partly rapid sand, with storage, ¹ shed control, and chlorination	With preliminary rapid sand and chlorination	With coagulation, etc.	With storage, ¹ shed control, and complete chlorination	With complete chlorination	With storage ¹		Without storage ¹
						With shed control	Without shed control	
<i>Underground</i>								
Wells.....								
Springs.....								
Infiltration gallery.....								
<i>Surface</i>								
Open rivers.....		8 2	9 1		10 2		11 4	12 15
Impounded streams.....	14 2		15 1	16 3		17 6	18 3	
Unprotected natural lakes.....								23 2
Protected natural lakes.....						26 1		
<i>Mixed</i>								
Wells and river.....			29 1					
Underground and impounded.....				30 1				
Lakes and wells.....						32 1	33 1	
Total number of cities.....	2	2	3	4	2	8	8	17
Total consumers.....	378,000	1,951,000	802,000	635,000	682,000	2,311,000	1,674,000	5,441,000
Per cent of total consumers.....	1.1	5.8	2.4	1.9	2.1	6.9	5.0	16.3

* Treatments employed for other purposes than sanitary are not included.

¹ For 3 days or longer.

² Albany (10 per cent of supply from lake; 30 to 90 per cent is by-passed around slow sand filters because of trouble in winter), Philadelphia (5 plants, 2 with preliminary rapid sand, 1 with preliminary coke).

³ Washington (also short storage and chlorination when needed).

⁴ Lawrence, Pittsburgh.

⁵ Bayonne, Cincinnati, Columbus, Louisville.

⁶ Detroit, Evansville, Flint, Grand Rapids, Harrisburg, Kansas City, Kans., Knoxville, Minneapolis, New Orleans, Omaha, St. Joseph, St. Louis, Toledo, Trenton, Tulsa.

⁷ Denver (small amount from infiltration gallery without treatment, and impounded supply is filtered partly by slow sand, partly by mechanical), Wilmington (half filtered by slow, half by rapid).

⁸ Springfield (also storage and shed control).

⁹ Hartford (emergency chlorination only), Providence, Wilkes-Barre.

¹⁰ Akron, Baltimore, Birmingham, Cambridge, Paterson, San Diego.

¹¹ Atlanta, Oklahoma City, Youngstown (excess lime used as disinfectant).

¹² Erie, Cleveland (partly unfiltered).

¹³ Norfolk.

¹⁴ Indianapolis (well water untreated; coagulation is intermittent; filtered water chlorinated continuously, raw water in cold weather).

¹⁵ Reading.

¹⁶ St. Paul (lakes are small, protected).

¹⁷ Fort Worth (lake is large, unprotected).

TABLE II.—Means of protection of public water supplies of 100 largest cities of the United States, by character of sources, showing the number of cities in each class and the number of consumers—Continued

Character of source	Coagulation with storage ¹ and complete chlorination	Storage, ¹ with shed control		Chlorination only		Mixed treatments (see text)	No treatment
		With complete chlorination	Without any chlorination	Complete	Partial or emergency		
<i>Underground</i>							
Wells.....				25	34		48
Springs.....		51		61			
Infiltration gallery.....				71			
<i>Surface</i>							
Open rivers.....	133						
Impounded streams.....	191	208	216			223	
Unprotected natural lakes.....		241		253			
Protected natural lakes.....		271	283				
<i>Mixed</i>							
Underground and impounded.....						215	
Total number of cities.....	4	11	9	10	4	8	8
Total consumers.....	1, 127, 000	2, 569, 000	1, 887, 000	4, 885, 000	386, 000	7, 743, 000	907, 000
Per cent of total consumers.....	3.4	7.7	5.7	14.6	1.2	23.2	2.7

¹ For 3 days or longer.² Dayton, Jacksonville, Memphis, Peoria, Wichita.³ Canton, Savannah, Schenectady, South Bend.⁴ Camden, El Paso, Fort Wayne, Houston, Lowell, San Antonio, Sioux City, Spokane.⁵ Newark.⁶ Allentown.⁷ Des Moines.¹³ Kansas City, Mo. (without storage), Richmond (filters under construction), Nashville.¹⁹ Jersey City (also shed control).²⁰ Bridgeport, Rochester (partly unchlorinated), Salt Lake City, San Francisco (emergency well supply filtered and chlorinated when used), Seattle, Tacoma (emergency well supply chlorinated when used), Utica, Waterbury.²¹ Boston, Lynn, Portland, Somerville, Troy, Worcester.²² New Haven, Scranton, Yonkers.²⁴ Duluth (without shed control).²⁵ Buffalo, Chicago, Milwaukee.²⁷ Syracuse.²⁸ Fall River, Manchester, New Bedford.³¹ Dallas, Elizabeth, Los Angeles, New York, Oakland.

Mixed treatments.—A few cities using water from more than one source employed the same treatment for all. There were eight cities with multiple sources, however, which did not treat all supplies alike, including three cities using two or more impounded supplies and five using a combination of underground and impounded water, as follows:

New Haven, with two impounded supplies, employed storage, watershed control, and chlorination for both, and in addition slow sand filtration for the smaller supply, which furnished one-third of the water consumed. Scranton, with six impounding reservoirs, used storage, shed control, and chlorination for all, and in addition rapid sand filtration for 10 per cent of the total supply. Yonkers employed slow sand filtration and chlorination for one impounded supply; and shed control, storage, and chlorination for the other.

In Dallas 80 per cent of the water used was from impounded supplies which were stored, filtered (rapid sand), and chlorinated, while the remainder, from wells, was untreated. Elizabeth's supply was half from wells, the remainder impounded; the former was chlorinated, the latter was stored, filtered (rapid sand), and chlorinated. One-fourth of the Los Angeles supply was chlorinated well water, the remainder, impounded, was stored and chlorinated and the watershed patrolled. New York's main supply from four impounding reservoirs was stored and chlorinated and the watersheds controlled, while the underground emergency supplies (two well supplies and one infiltration gallery) in the boroughs of Brooklyn and Richmond, of which about 50 m. g., or 7 per cent of the total consumption, were used daily in Brooklyn, received no treatment other than chlorination. In Oakland 30 per cent of the supply was chlorinated well water and 70 per cent was distributed from an impounded controlled watershed after treatment by storage, rapid sand filtration, and chlorination.

Relation of treatment and source.—With very few exceptions underground supplies were either entirely untreated or only chlorinated. Cities using water from open rivers in nearly all instances relied upon filtration and chlorination as the principal means of protection, rapid sand filtration being the usual method. Of those supplied from impounded sources about one-half depend on storage, filtration (with rapid sand somewhat more common than slow sand filters), and chlorination; while most of the other half relied principally upon storage and sanitary control of the watershed, more often with chlorination than without. Of the Great Lakes supplies, one-third were filtered (rapid sand) and chlorinated, the others were protected by chlorination alone, except one (Duluth) which received short storage in addition. The water from small natural lakes was protected by long storage and watershed control, with or without chlorination, while one such supply (Norfolk) was also filtered.

Summary of treatment methods in use.—Either alone or in conjunction with other methods, for all or part of the supply, slow sand filtration was employed in 15 cities, rapid sand filtration in 42, coagulation with detention in 49, storage for three days or longer in 55, partial or complete sanitary control of the watershed in 40, complete and continuous chlorination in 73, partial or emergency chlorination in 8, and disinfection with excess lime in 1.

Watershed control.—Sanitary control of the watershed was practiced for most of the impounded and small natural lake supplies. Of the 39 cities taking all or part of their water from impounded streams, 6²⁶ exercised complete control of their watersheds, 28 had

²⁶ New Haven, Oakland, Portland, San Diego, San Francisco, Springfield.

partial control, and 5²⁷ attempted no control. Of the 6 cities taking all or part of their water from small natural lakes, 1 (New Bedford) exercised complete control of its watershed and 5 had partial control.

Length of storage.—The period of storage had a wide range of variation. Of the 55 cities which provided storage for three days or longer for all or part of their supply, the length of storage was under one week in 11, between one week and one month in 9, between one month and one year in 20, and over one year in 15.

Filter capacity.—On the basis of the ratio between the average rate of operation and the rated capacity of the filters, as reported in the schedule, some plants were approaching and a few had passed the load limit for which they were designed. Of the 53 cities using filtered water the average rate of filtration did not exceed 75 per cent of filter capacity in 31, was between 76 and 90 per cent in 9,²⁸ between 91 and 100 per cent—that is, close to or at capacity—in 8,²⁹ and exceeded the rated capacity of the filters by a dangerous margin in 2 (Knoxville and Lawrence). For the 2 remaining cities (Albany and Wilkes-Barre) data were not available. Five of the 10 cities operating their filters at over 90 per cent of capacity had already taken steps to remedy the situation. Lawrence was seeking to secure an additional supply from a less polluted source than the Merrimack River, while enlargement of filter capacity was either under way or planned in Erie, Flint, Kansas City, Kans., and Knoxville.

Supervision of treatment.—As would be expected in the case of large cities, technical supervision of purification plants was the rule. Of the 84 cities which treated their water more than by storage alone, a chemist or bacteriologist supervised the treatment in 36, a graduate engineer (water, filtration, sanitary, or purification engineer) in 23, a superintendent (plant, general, or filtration superintendent) in 18, information is lacking for 5,³⁰ the pumping-station engineer had charge in 1 (Canton, where emergency chlorination was the only treatment), and a "plant operator" in 1 (Wichita, where chlorination only was employed).

Special treatments to improve physical quality.—In addition to treatments used for sanitary purposes a number of cities employed special treatments to improve the physical quality of their supplies. Aeration was used by Jacksonville for the removal of sulphur fumes, by New York (at Ashoken and Kensico Reservoirs) to remove odors and tastes of algal origin, by Memphis in conjunction with rapid sand filtration to remove carbon dioxide and iron, and by Hartford.

²⁷ Atlanta, Dallas, Elizabeth, Oklahoma City, Youngstown.

²⁸ Atlanta, Baltimore, Denver, Elizabeth, Indianapolis, Philadelphia, Providence, Springfield, Tulsa.

²⁹ Cambridge, Cleveland, Erie, Flint, Hartford, Kansas City (Kans.), New Orleans, Reading.

³⁰ Akron, Oakland, San Diego, Tacoma, Utica.

Lowell removed iron and manganese by means of coke and sand filters. Water softening was resorted to by Columbus, Grand Rapids, St. Louis, and was contemplated by Dayton.

Cross connections with other supplies.—Nearly one-third of the cities admitted having their public supply cross connected with private industrial supplies, often of poor quality, or with some highly polluted source used for boiler, fire, or street-washing purposes. Of this group, 10 reported that double-check valves were used on cross connections;³¹ 3 stated that an approved type of check valve was required,³² but no information was given as to which type was approved; and 20 either used gate or single-check valves or gave no particulars.³³ Cross connections were to be eliminated in Indianapolis by State regulation by June 1, 1924, and were prohibited in St. Paul after November 1, 1924. The Chicago Health Department was recommending an ordinance requiring property owners to report all cross connections and to furnish diagrams.

Of the remaining 67 cities, no information regarding cross connections was available for 1 (Albany); 3 city supplies were cross connected with supplies of private companies serving portions of the city, presumably of good quality;³⁴ in 15 the regular supply was cross connected with one or more emergency supplies, some of doubtful quality;³⁵ 9 cities reported that cross connections with the public supply were prohibited;³⁶ and in the other 39 cities cross connections were absent so far as known. That it is difficult to be certain of the absence of cross connections was indicated by the reports from Allentown and Reading. No cross connections were known to exist in these cities, but the single-check valves used on all services, principally to prevent back pressure on the meters, afforded a sense of security against possible cross-connection pollution. Similarly, Dayton, which reported no known cross connections, at the same time contemplated a check-up of industrial plants.

LABORATORY CONTROL

Supervision.—Bacteriological analyses of public water supplies were conducted by the municipal water authorities in 51 cities, by

³¹ Bridgeport, Indianapolis (some connections have single-check valves), Lawrence, Manchester, New Bedford, New Orleans, Oakland, Omaha, Toledo, Trenton.

³² Akron, Canton, Savannah.

³³ Bayonne, Chicago, Dallas, Detroit, El Paso, Fort Worth, Houston, Kansas City (Kans.), Lynn (1 large industry has salt-water system connected to city mains), New Haven, Oklahoma City, Pittsburgh, St. Paul, San Antonio, San Francisco, Sioux City, Troy, Utica, Waterbury, Youngstown.

³⁴ Camden, Harrisburg, New York.

³⁵ Baltimore, Cambridge, Elizabeth, Jersey City, Kansas City (Mo.), Knoxville (raw river water can be pumped directly into mains, but no fire in last 10 years has been big enough to demand such by-passing), Newark, Paterson, San Diego, South Bend, Springfield, Tacoma, Tulsa, Wilkes-Barre, Worcester.

³⁶ Allentown, Atlanta, Boston, Columbus, Hartford, Lowell, Minneapolis, Portland, Somerville.

the local health department exclusively in 25,⁸⁷ by the water company in 13,⁸⁸ by the State Department of Health exclusively in 7,⁸⁹ by the Metropolitan District Commission (a State agency) in Boston and Somerville, by a contract laboratory in Troy, and in San Antonio there was no record of any recent analyses by any agency. Check analyses were also made of many supplies, usually by the local health department, sometimes by the State.

The laboratories of the local and State Health Departments were usually located in or near the department offices. The other water laboratories were for the most part situated at the filter plant, and a few at the water plant, pumping station, reservoir, or waterworks office.

Personnel.—Considering only the 64 laboratories operated by city water authorities or by water companies; that is, those which were exclusively water laboratories, the following table shows the personnel, including both technically trained employees (i. e. chemists, bacteriologists, technicians, or sanitary engineers) and laboratory helpers (or assistants, attendants, etc.):

Laboratory personnel

Technical employees	Laboratory helpers	Number of cities	Cities
1-----	0	12	Bridgeport, Buffalo, Cambridge, Camden, Elizabeth (for each water company), Knoxville, Memphis, Milwaukee, St. Joseph, Tulsa, Wilkes-Barre, Youngstown.
1-----	1	17	Akron, Dallas, Erie, Evansville, Fort Worth, Hartford, Jersey City, Kansas City, Kans., Louisville, Lowell, Newark, Norfolk, Omaha, Richmond, Springfield, Toledo, Trenton (chemist devoted only part time to water laboratory).
1-----	2	3	Birmingham (helpers were part-time inspectors), Oakland, Paterson.
1-----	3	2	Los Angeles, Washington.
2-----	0	5	Atlanta, Flint, New Haven, Reading, Yonkers.
2-----	1	8	Bayonne, Cincinnati, Denver, Des Moines, Grand Rapids, Harrisburg, Minneapolis, Wilmington.
2-----	2-4	3	Providence, 2; Oklahoma City, 3; Indianapolis, 4.
3-----	0	2	St. Paul, Scranton.
3-----	1	3	Cleveland, Kansas City, Mo., New Orleans.
3-----	2	1	Baltimore.
Over 3-----	-----	6	(See text following.)

Six water laboratories employed 4 or more technical personnel, as follows: Columbus, 4 chemists; Detroit, 5 persons (designations not given); St. Louis, 2 chemists, 1 bacteriologist, 2 assistants, 3 helpers; Philadelphia, 2 chemists, 4 bacteriologists, 1 laboratory assistant, laborers, and sample collectors; Pittsburgh, 1 chief analyst,

⁸⁷ Albany, Allentown, Canton, Chicago, Dayton, El Paso, Fort Wayne, Houston, Jacksonville, Nashville, Portland, Rochester, Salt Lake City, San Diego, San Francisco, Savannah, Schenectady, Seattle, Sioux City, South Bend, Spokane, Syracuse, Tacoma, Waterbury, Wichita.

⁸⁸ Bayonne, Birmingham, Bridgeport, Elizabeth, Indianapolis, New Haven, Oakland, Paterson, Peoria, St. Joseph, Scranton, Utica, Wilkes-Barre.

⁸⁹ Camden, Fall River, Lawrence (experiment station of State health department), Lynn, Manchester, New Bedford, Worcester.

10 assistants; New York, 19 persons (designations not given). For the other 2 laboratories (Peoria and Utica) there was no information concerning personnel.

The survey data on water laboratory personnel and expenditures were not altogether complete, nor were they clear regarding the inclusion of filter attendants, but in this summary the latter have been excluded from the figures so far as the information permitted.

Expenditures.—Of the same 64 water laboratories the annual per capita expenditure, including salaries and supplies, was not available for 11, and the others reported as follows:

Expenditures for laboratories

Cents per capita	Number of cities	Cities
0 to 1.....	4	Buffalo, Detroit, Milwaukee, New York.
1 to 2.....	18	Baltimore, Bridgeport, Cincinnati, Cleveland, Elizabeth, Hartford, Jersey City, Los Angeles, Louisville, Minneapolis, Newark, New Orleans, Norfolk, Philadelphia, St. Louis, Trenton, Tulsa, Washington.
2 to 3.....	14	Birmingham, Cambridge, Dallas, Denver, Erie, Kansas City, Mo., Lowell, Memphis, Oakland, Omaha, Pittsburgh, Reading, St. Paul, Springfield.
3 to 4.....	7	Duluth, Indianapolis, Knoxville, Providence, Wilkes-Barre, Wilmington, Youngstown.
4 to 5.....	5	Columbus, Des Moines, Flint, Fort Worth, Kansas City, Kans.
Over 5.....	5	Bayonne, 7; Grand Rapids, 8; Harrisburg, 6; Oklahoma City, 12; Yonkers, 6.

Examinations.—Routine bacteriological examinations of the public water supply were made daily or oftener in 68 of the 100 cities surveyed; two to five times a week in 10,⁴⁰ of which 4 (Birmingham, Lawrence, Pittsburgh, and Wilkes-Barre) were filter plants, the remainder being impounded or well waters receiving no regular treatment except chlorination in the case of 3; weekly in 9,⁴¹ of which only 1 (San Diego) was a rapid sand filter plant; the remainder being impounded or well waters receiving no regular treatment except chlorination of part of Rochester's supply; biweekly in 3,⁴² of which the only supply receiving any treatment was Bridgeport's, which was chlorinated; monthly in 2 (Portland and Spokane), and rarely in the remaining 8,⁴³ the last 10 being impounded or well waters receiving no treatment.

Bacteriological examinations included total counts and *B. coli* determinations in nearly all cities. Those which specified their procedure were about equally divided between 37° C. and both 20° C. and 37° C. counts. Most cities did not state whether their presumptive *B. coli* determinations were confirmed to any degree.

⁴⁰ Birmingham, Houston, Lawrence, Pittsburgh, Salt Lake City, Schenectady, Seattle, South Bend, Wichita, Wilkes-Barre.

⁴¹ Boston, Fort Wayne, Rochester, San Diego, San Francisco, Savannah, Sioux City, Somerville, Tacoma.

⁴² Bridgeport, El Paso, Manchester.

⁴³ Camden (at odd times), Fall River (one in 1923), Lowell (none in 1923), Lynn (one in 1923), New Bedford (one in 1923), San Antonio (last one in 1922), Troy (no record), Worcester (none in 1923).

Concerning the frequency of chemical examinations the information at hand is incomplete, but such data as exist show a greater frequency of sampling for some chemical determinations than for others, and usually more frequent complete bacteriological examinations than complete chemical.

Microscopic examinations were made by 24 cities,⁴⁴ all using impounded or lake water except Pittsburgh's river supply, at intervals varying from one day to one year or more. Other miscellaneous laboratory work included studies of phenol wastes at Cleveland, examinations of coal and lubricating oils at Toledo, etc.

Only one laboratory (Pittsburgh) did not follow the A. P. H. A. standard methods of water analysis. All others, except the five which used the standard methods in part or with slight variations,⁴⁵ followed the standard methods completely.

BACTERIAL QUALITY OF PUBLIC WATER SUPPLIES

Specific figures showing total bacterial counts are at hand for only a small number of cities. There is available, however, information for most cities on the *B. coli* content of the water (whether presumptive or confirmed usually not stated) and for many on the percentage of samples meeting the Treasury Department standard for purity. The individual figures can not be considered altogether trustworthy.

Raw water.—The *B. coli* content of untreated waters from different types of sources varies widely. River supplies showed by far the highest degree of pollution in 1923, 24 river waters averaging 90 per cent of 10 cubic centimeter samples showing *B. coli*. In the next class were supplies from large unprotected lakes, with six such waters averaging 53 per cent of 10 cubic centimeter samples positive, and those from impounded streams, 26 of which averaged 45 per cent positive. Wells when properly protected yielded by far the least polluted of raw waters, 14 well supplies averaging less than 1 per cent positive. Underground waters other than from wells showed a somewhat higher incidence of *B. coli*. Of two small lake supplies for which figures were available, one was very good, the other very poor.

Some but not extreme variation in the frequency of occurrence of *B. coli* in 10 cubic centimeter samples existed among the individual raw waters from each type of source.

⁴⁴ Akron (when necessary), Baltimore (semiweekly), Boston (biweekly), Bridgeport, Buffalo (none in 1923), Cambridge (weekly), Denver, Fall River, Hartford (weekly), Los Angeles, Lynn (monthly), Milwaukee, Newark, New Bedford, New York (weekly), Norfolk, Oakland (special biological studies in 1923), Pittsburgh, Providence (daily), Reading (weekly), San Diego, Somerville (biweekly), Worcester (none in 1923), Yonkers.

⁴⁵ Duluth (no 10 c. c. portions), Newark (10 c. c. portions only), New York (use of bile), Scranton (in part), Yonkers (also bile for *B. coli*).

The frequency distribution of the 100 public water supplies according to the percentage of 10 cubic centimeter samples of raw water showing *B. coli* in 1923, or the estimated equivalent in the case of those reported in other dilutions or terms, is shown in the following tabulation:

B. coli content of raw water, 1923

Per cent positive in 10 c. c. (or equivalent)	Number of cities	Cities
100.....	23	Albany (index 100 per c. c.), Cincinnati (90 per cent of 1 c. c.), Cleveland (index 130-180 per c. c., 1922), Evansville, Grand Rapids (96 per cent of 1 c. c.), Harrisburg, Indianapolis (index 30 per c. c.), Jersey City, Kansas City, Kans., Kansas City, Mo. (98 per cent of 0.1 c. c.), Lawrence (100 per cent of 0.1 c. c.), Louisville (index 37 per c. c.), Minneapolis, Omaha (nearly 100 per cent of 1 c. c.), Philadelphia, Providence, St. Joseph, St. Louis (61 per cent of coagulated 10 c. c. samples), Trenton (98 per cent of 1 c. c., 1922), Tulsa (100 per cent of 5 c. c.), Wilmington (93 per cent of 1 c. c.), Yonkers (100 per cent of 1 c. c.), Youngstown.
90 to 99.....	6	Atlanta (80 per cent of 1 c. c.), Bayonne, Columbus (75 per cent of 1 c. c.), Norfolk, Richmond (81 per cent of 1 c. c.), Toledo (77 per cent of 1 c. c.).
80 to 89.....	8	Flint (50 per cent of 1 c. c.), Knoxville ("badly polluted"), Nashville ("badly polluted"), Paterson (50 per cent of 1 c. c.), Pittsburgh ("badly polluted"), Reading, Salt Lake City, Washington.
70 to 79.....	4	Denver, Duluth (33 per cent of 1 c. c.), Milwaukee, Scranton (32 per cent of 1 c. c.).
60 to 69.....	5	Baltimore, Chicago, Fort Worth, Newark (1922), St. Paul.
50 to 59.....	2	Erie (18 per cent of 1 c. c., 1922), Wilkes-Barre (25 per cent of 2 c. c.).
40 to 49.....	2	Akron, Cambridge.
30 to 39.....	3	Buffalo (22 per cent of 5 c. c.), New Orleans (7.5 per cent of 1 c. c.), Springfield (22 per cent of 5 c. c.).
20 to 29.....	4	Bridgeport (1922), Dallas, Des Moines, Los Angeles (aqueduct 20 per cent, Los Angeles River 99 per cent of 0.01 c. c., infiltration gallery 0 per cent of 100 c. c.).
10 to 19.....	4	New Haven, Oklahoma City, San Francisco, Troy.
1 to 9.....	15	Allentown ("rarely"), Birmingham, Canton, Detroit, Elizabeth ("rarely"), El Paso, Fall River ("small percentage"), Hartford, Houston ("usually none"), Jacksonville ("excellent"), Manchester, San Diego, Savannah, Waterbury, Worcester ("excellent").
0.....	13	Camden, Dayton, Fort Wayne, Lowell, Lynn, Memphis, Portland, Rochester, Schenectady, Sioux City, South Bend, Spokane, Wichita.
No data.....	11	Boston, New Bedford, New York, Oakland, Peoria, San Antonio, Seattle, Somerville, Syracuse, Tacoma, Utica.

Treated water.—The colon bacilli content of treated waters is much less dependent on type of source than that of raw waters. The highest degree of pollution in 1923 was shown by treated waters from large unprotected lakes, 6 of which averaged 12 per cent positive for *B. coli* in 10 cubic centimeter samples. In the middle class were impounded supplies, 32 of which averaged 7 per cent positive after treatment; river waters, 27 of which averaged 6 per cent; the 2 spring supplies, which averaged 5 per cent; and protected lake supplies, 4 of which averaged 3 per cent positive. The lowest incidence of *B. coli* obtained in well waters, 15 of which, as well as 1 infiltration gallery supply, averaged under 1 per cent positive in 10 cubic centimeter samples.

The frequency distribution of the 100 public water supplies according to the percentage of 10 cubic centimeter samples of treated water showing *B. coli* in 1923, or the estimated equivalent for those

reported in other dilutions or terms, is presented in the following tabulation :

B. coli content of treated water, 1923

Per cent positive in 10 c. c (or equivalent)	Num- ber of cities	Cities
40 to 49-----	2	Providence (41 per cent presumptive in 1923; in 1924, 5 per cent confirmed), Yonkers (gas formers in 40 per cent of 10 c. c. samples and in 2.2 per cent of 1 c. c.).
30 to 39-----	1	Lawrence.
20 to 29-----	8	Cleveland (1922 index 0.09-3.4 per c. c.), Fort Worth (presumptive, 12.4 per cent confirmed), Los Angeles (3 per cent of 1 c. c.), Milwaukee, Salt Lake City, Tacoma, Tulsa, Wilmington (3.7 per cent of 1 c. c.).
10 to 19-----	8	Boston (1922), Chicago, Evansville, Newark (1922), Seattle, Somerville (1922), Toledo (1922), Troy.
5 to 9-----	9	Columbus, Dallas, El Paso, Flint, Kansas City, Mo., Louisville (index 0.006 per c. c.), Norfolk, Philadelphia, St. Louis.
1 to 4-----	39	Akron, Albany, Baltimore, Bayonne, Bridgeport (1922), Buffalo (2 per cent of 5 c. c.), Canton, Cincinnati, Denver ("very seldom"), Detroit, Elizabeth ("rarely"), Fall River ("small percentage"), Grand Rapids (0.6 per cent of 1 c. c.), Hartford, Houston ("usually none"), Indianapolis (1922), Jackson- ville ("excellent"), Jersey City, Kansas City, Kans., Knoxville, Manchester, Minneapolis, New Orleans, New York, Reading, Richmond, St. Joseph, St. Paul, San Diego, San Francisco, Savannah, Scranton (0.6 per cent of 1 c. c.), Springfield, Trenton (1922), Washington, Waterbury ("rarely"), Wilkes-Barre, Worcester ("excellent"), Youngstown (1922).
0-----	29	Atlanta, Allentown, Brimingham, Cambridge, Camden, Dayton, Des Moines, Duluth, Erie (none in 1 c. c., 1922), Fort Wayne, Harrisburg, Lowell, Lynn, Memphis, Nashville, New Bedford, New Haven, Omaha, Paterson, Peoria, Pittsburgh, Portland, Rochester, Schenectady, Sioux City, South Bend, Spokane, Syracuse, Wichita.
No data-----	4	Oakland, Oklahoma City, San Antonio, Utica.

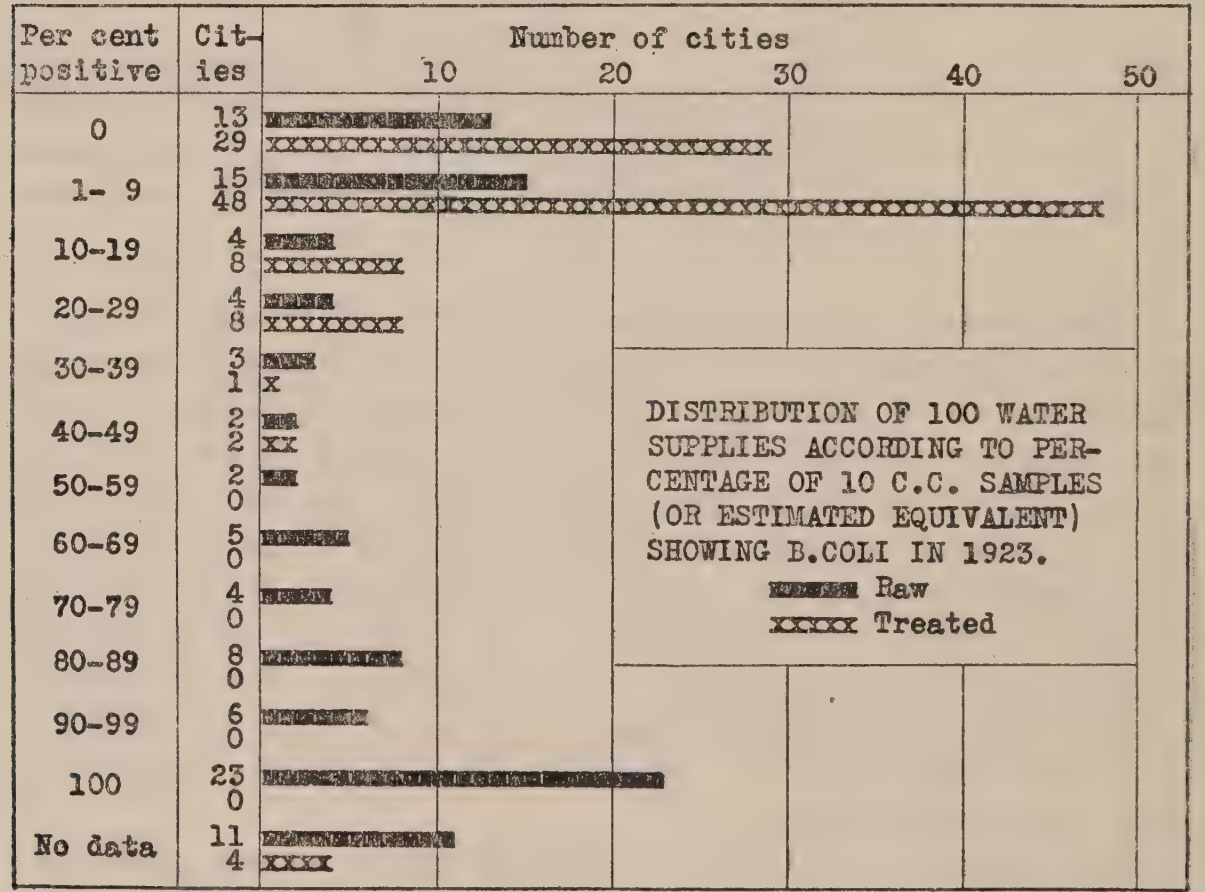


FIG. 13

The percentage of samples of finished water meeting the former Treasury Department standard for purity during 1923 was not

known for 15 cities.⁴⁶ Of the remainder, 42 supplies were reported within the standard 100 per cent of the time, 7 "probably" 100 per cent,⁴⁷ 8 "practically" 100 per cent,⁴⁸ 15 from 95 to 100 per cent,⁴⁹ 6 from 90 to 95 per cent,⁵⁰ and 7 less than 90 per cent of the time.⁵¹

CONSUMPTION

Per cent of population using supply.—For two cities information was not at hand regarding the proportion of the population using the public supply. For the others the following percentages were reported:

Population using public water supplies

Per cent using	Number of cities	Cities
100	31	Bayonne, Boston, Buffalo, Cambridge, Cleveland, Fall River, Grand Rapids, Jersey City, Lawrence, Lowell, Lynn, Milwaukee, Newark, New Bedford, New Haven, Paterson, Portland, Providence, St. Louis, Savannah, Schenectady, Scranton, Somerville, Spokane, Trenton, Troy, Utica, Wilkes-Barre, Worcester, Wilmington, Yonkers.
95-100	38	Albany, Allentown, Atlanta, Baltimore, Bridgeport, Canton, Cincinnati, Chicago, Columbus, Dallas, Denver, Detroit, Duluth, Elizabeth, El Paso, Erie, Harrisburg, Hartford, Kansas City, Mo., Knoxville, Los Angeles, Manchester, Memphis, New Orleans, Norfolk, Oakland, Oklahoma City, Philadelphia, Reading, St. Paul, Salt Lake City, San Antonio, San Diego, San Francisco, Seattle, Springfield, Syracuse, Toledo.
90-95	18	Akron, Birmingham, Evansville, Fort Worth, Houston, Jacksonville, Louisville, Minneapolis, New York, Omaha, Pittsburgh, Richmond, Rochester, St. Joseph, South Bend, Tacoma, Waterbury, Youngstown.
80-90	9	Camden, Dayton, Des Moines, Flint, Fort Wayne, Kansas City, Kans., Nashville, Washington, Wichita.
70-80	2	Indianapolis, Sioux City.

For six of the cities there is considerable disagreement between these figures and the survey data on private water supplies.⁵²

In many cities the percentage of the population accessible to the public supply was greater than that using it, the difference being usually not over 3 per cent of the population. In the following cities, however, the difference was so great as to warrant further attempts to abolish private supplies of doubtful quality used for drinking: Kansas City, Kans., 15 per cent; Louisville, 10 per cent; Nashville, 10 to 20 per cent; Omaha, 10 per cent; Pittsburgh, 7 per cent; St. Joseph, 8 per cent; Toledo, 5 per cent.

⁴⁶ Akron, Albany, Boston, Buffalo, Lowell, Newark, Oakland, Paterson, St. Louis, Somerville, Tacoma, Toledo, Tulsa, Utica, Worcester.

⁴⁷ Camden, Fort Wayne, New Bedford, New York, San Antonio, Wilkes-Barre, Wilmington.

⁴⁸ Elizabeth, Jacksonville, Norfolk, Oklahoma City, Providence, Richmond, San Diego, Youngstown.

⁴⁹ Bridgeport, Columbus, Duluth, Flint, Fort Worth, Grand Rapids, Jersey City, Kansas City (Kans.), Kansas City (Mo.), Knoxville, New Orleans, Philadelphia, Reading, St. Joseph, San Francisco.

⁵⁰ Cleveland, Dallas, Denver, Louisville, Manchester, Savannah.

⁵¹ Chicago (83.9 per cent in 1923; 99.7 per cent in 1924), Lawrence (63 per cent), Los Angeles (85 per cent), Milwaukee (74 per cent), Salt Lake City (85 per cent), Troy (60 per cent), Yonkers (53.4 per cent).

⁵² Dallas, Evansville, Pittsburgh, Rochester, St. Joseph, Wichita.

Per capita consumption.—In 1923 the average daily consumption of water per consumer⁵³ ranged between 45 gallons for Lawrence and 275 for Chicago, and the average for the 100 cities surveyed is 123. The frequency distribution is as follows:

Per capita consumption of water, 1923

Gallons per day	Number of cities	Cities
40-59	3	Fall River, Lawrence, Lowell.
60-79	12	Dallas, El Paso, Fort Wayne, Fort Worth, Knoxville, Lynn, Manchester, New Bedford, Oakland, Oklahoma City, St. Paul, San Francisco.
80-99	22	Akron, Columbus, Des Moines, Duluth, Hartford, Houston, Jacksonville, Memphis, Newark, Norfolk, Peoria, Providence, Rochester, Sioux City, Somerville, South Bend, Springfield, Tulsa, Utica, Waterbury, Worcester, Youngstown.
100-119	18	Birmingham, Boston, Cambridge, Cincinnati, Evansville, Flint, Grand Rapids, Los Angeles, Minneapolis, Nashville, New Orleans, Paterson, Richmond, San Diego, Savannah, Toledo, Wichita, Wilkes-Barre.
120-139	17	Allentown, Atlanta, Baltimore, Camden, Dayton, Detroit, Harrisburg, Jersey City, Kansas City, Mo., Milwaukee, New Haven, Omaha, Portland, San Antonio, Trenton, Wilmington, Yonkers.
140-159	11	Canton, Cleveland, Indianapolis, Louisville, New York, St. Joseph, St. Louis, Schenectady, Scranton, Seattle, Syracuse.
160-179	5	Bridgeport, Elizabeth, Philadelphia, Reading, Washington.
180-199	3	Albany, Bayonne, Kansas City, Kans.
200-219	2	Denver, Erie.
220-239	4	Buffalo, Salt Lake City, Spokane, Tacoma.
240-259	1	Pittsburgh.
260-279	2	Chicago, Troy.

Meters.—Over half the cities surveyed had between 90 and 100 per cent of their services metered, and only one-third were less than 75 per cent metered, the average for all cities being 73 per cent. The frequency distribution is as follows:

Per cent of services metered, 1923

Per cent metered	Number of cities	Cities
0-10	8	Allentown, Camden (6 per cent, large consumers), Chicago, Erie (3.5 per cent, large consumers), St. Louis, Schenectady, Tacoma, Troy.
10-20	5	Baltimore, Buffalo, Denver, Louisville, Savannah.
20-30	6	Bridgeport, New York, Philadelphia, St. Joseph, Trenton, Wilkes-Barre.
30-40	3	Jersey City, New Haven, Portland.
40-50	4	Albany, Cambridge, Pittsburgh, Salt Lake City.
50-60	2	Indianapolis, San Antonio.
60-70	1	Richmond.
70-80	9	Boston, Duluth, Elizabeth, Harrisburg, Kansas City, Mo., Lynn, Newark, Peoria, Reading.
80-90	9	Dayton, Kansas City, Kans., Lawrence, Manchester, St. Paul, Somerville, Toledo, Washington, Wilmington.
90-100	53	All other cities.

Cities having a limited source of supply and those having expensive treatment works were for the most part more completely metered than others.

⁵³ The actual number of consumers is used as a basis for computing per capita consumption, because the use of total population is misleading and usually gives an apparent consumption lower than the actual. When 100 per cent of the population use the public supply both rates are identical.

In general, the more completely metered cities had the lowest per capita consumption. (See fig. 14.) While for the group as a whole there were a number of exceptions to this trend, there is little doubt that for the individual city more complete metering means a reduced rate of consumption.

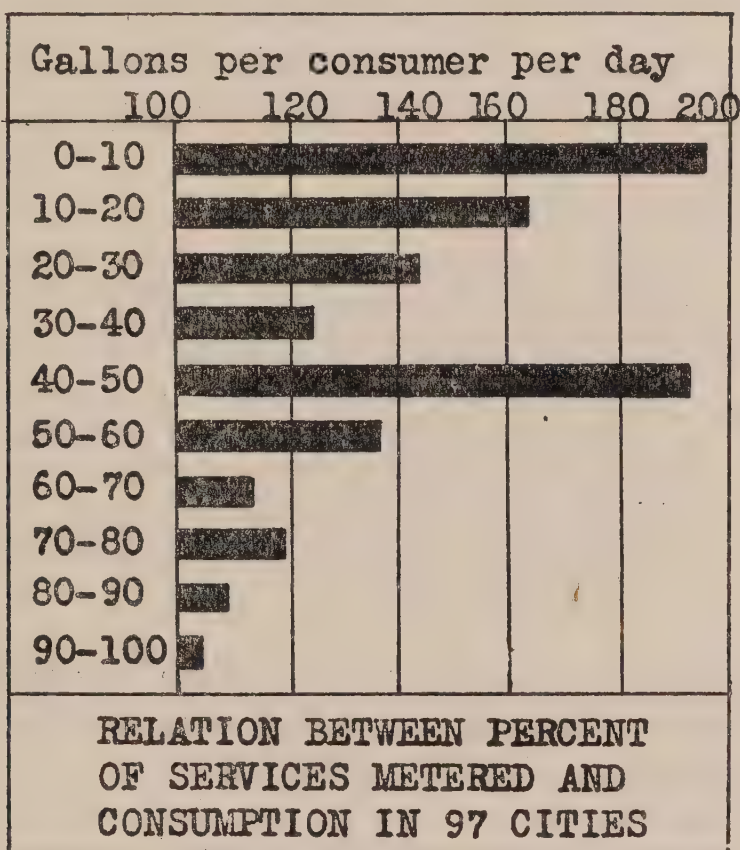


FIG. 14

PRIVATE SUPPLIES

In sparsely settled outskirts and in newly annexed territory where mains are either lacking or inadequate, most cities utilized some private water supplies for domestic purposes, usually wells. In most cities, too, the larger industries and some hotels obtained water for fire protection or industrial use, sometimes for drinking, from private wells or from polluted rivers or lakes. Practically all cities consumed some bottled water.

Private wells.—For 5 cities there was no record of the number of private wells used for domestic purposes, 29 cities reported “none,” 31 claimed either “very few” or less than 100 wells, 11 had from 100 to 500, 4 had between 500 and 1,000,⁵⁴ 11 had over 1,000,⁵⁵ and the other 9 reported a “large number.”⁵⁶

The type of private wells in use in 8 cities was not known, 17 cities had deep (“bored,” “drilled,” “driven,” or “artesian”)

⁵⁴ Duluth, Richmond, San Francisco, Tulsa.

⁵⁵ Des Moines, Kansas City (Kans.), Oakland, Omaha, Peoria, Philadelphia, Pittsburgh, South Bend, Toledo, Waterbury, Youngstown.

⁵⁶ Akron, Flint, Indianapolis, Jacksonville, Minneapolis, Nashville, Sioux City, Washington, Wichita.

wells,⁵⁷ 26 shallow ("surface" or "dug") wells, and 20 both types.⁵⁸

In two cities (Los Angeles and Oklahoma City) the percentage of the total population using private wells for domestic purposes was not known, in 29 none of the population used private wells, and for the remaining cities the following percentages were reported:

Population using private domestic wells

Per cent using	Number of cities	Cities
Under 1.....	18	Albany, Cincinnati, Dallas, Denver, Elizabeth, El Paso, Hartford, Jersey City, Kansas City, Mo., Milwaukee, Paterson, Philadelphia, Pittsburgh, St. Joseph, St. Paul, Spokane, Syracuse, Utica.
Very small.....	16	Atlanta, Baltimore, Buffalo, Camden, Chicago, Cleveland, Columbus, Detroit, Erie, Houston, New York, Reading, San Diego, San Francisco, Scranton, Wilmington.
1 to 5.....	16	Bridgeport, Canton, Duluth, Evansville, Knoxville, Manchester, Memphis, Minneapolis, Norfolk, Oakland, Richmond, Salt Lake City, San Antonio, Toledo, Waterbury, Wichita.
5 to 10.....	9	Akron, Birmingham, Fort Worth, Jacksonville, Louisville, Omaha, Peoria, Tulsa, Youngstown.
Over 10.....	10	Dayton (15), Des Moines (estimated 20), Flint (estimated 18), Fort Wayne (estimated 15), Indianapolis (estimated 30), Kansas City, Kans. (about 20), Nashville (10-20), Sioux City (estimated 25), South Bend (estimated 13), Washington (probably 15).

As was previously noted, for 6 cities there was considerable disagreement between these figures and the survey data on the per cent of the population using the public supply.

The quality of the water from private wells was not known for 10 cities,⁵⁹ was reported as good (or "safe" or "satisfactory") in 19, fair (or "indifferent" or "generally safe") in 12, poor (or "bad," "doubtful," or "contaminated") in 25,⁶⁰ and mixed in 5.⁶¹

Of 26 private deep-well supplies of known quality, 14 were reported good, 3 fair, and 9 poor. Of 28 private shallow-well supplies of known quality, 5 were good, 6 fair, and 17 poor. In Figure 15 the relation of quality and type of well is given on a percentage basis. The doubtful quality of the majority of well supplies, particularly from shallow wells, is clearly evident.

⁵⁷ Camden, Canton, Columbus, Dayton, Des Moines, Evansville, Fort Wayne, Fort Worth, Houston, Jacksonville, Minneapolis, Nashville, Norfolk, Oklahoma City, St. Paul, Tulsa, Wichita.

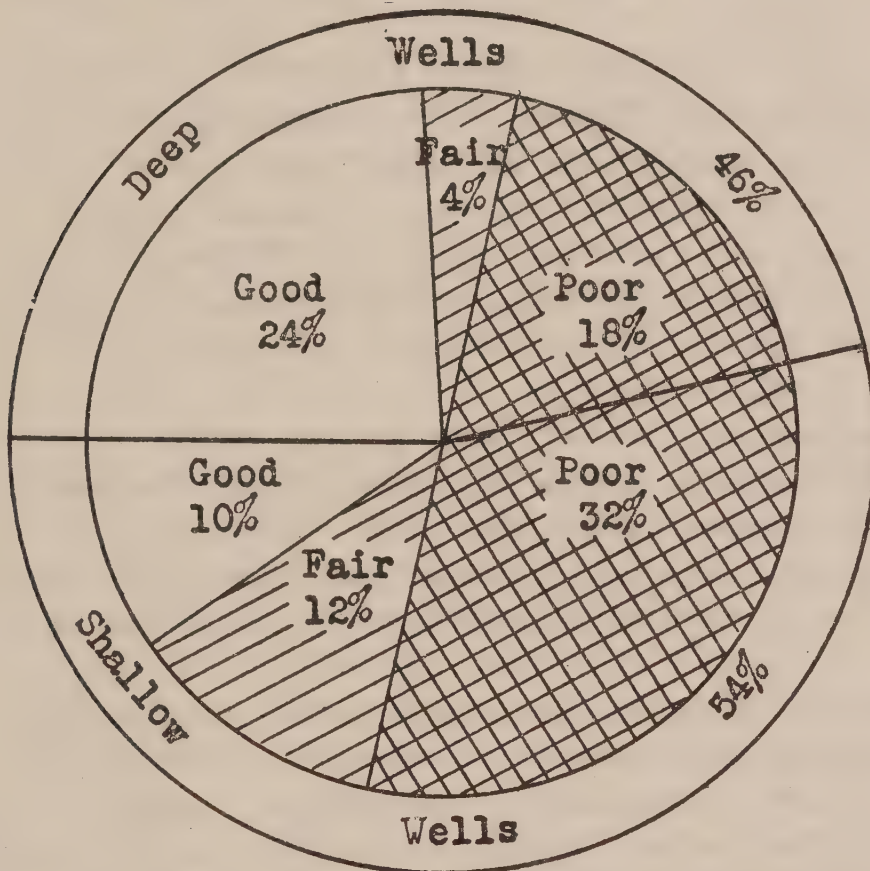
⁵⁸ Baltimore, Chicago, Cincinnati, Hartford, Indianapolis, Kansas City (Kans.), Kansas City (Mo.), Manchester, Memphis, Milwaukee, Oakland, Pittsburgh, Richmond, Salt Lake City, San Antonio, San Diego, San Francisco, Sioux City, South Bend, Youngstown.

⁵⁹ Albany, Atlanta, Chicago, Detroit, Erie, New York, Peoria, Spokane, Syracuse, Utica.

⁶⁰ Baltimore (80 per cent bad in 1924), Birmingham, Bridgeport, Dayton, Denver, Des Moines (51 per cent of samples bad in 1923), Duluth, Elizabeth, El Paso, Flint (50 per cent bad in 1920), Fort Worth, Kansas City (Mo.), Knoxville (17 out of 29 examined in 1923 contained *B. coli*), Minneapolis, Nashville (70 per cent polluted), Paterson, Reading, St. Joseph (70 per cent contaminated), San Antonio, Scranton, Sioux City, Toledo, Tulsa, Wichita (60 per cent contaminated), Youngstown (50 per cent bad).

⁶¹ Cincinnati (driven wells good, 42 per cent of shallow polluted), Hartford (fair to good), Indianapolis (fair in outlying districts, poor in built up), Memphis (deep wells good, 33 per cent of shallow had *B. coli*), Oakland (50 per cent of dug wells and 13 per cent of bored polluted).

It is estimated that over 900,000, or about 3 per cent, of the residents of the 100 cities surveyed used private well supplies for domestic purposes. One-half of this number used well water of poor quality, one-fourth used fair water, and one-fourth used good water.



QUALITY AND TYPE OF 50 KNOWN PRIVATE WELL SUPPLIES, SHOWING THE DOUBTFUL QUALITY OF WELL WATERS, PARTICULARLY FROM SHALLOW WELLS.

FIG. 15

Other private supplies.—In 76 cities no other private supplies for domestic use were reported; in 11 private companies supplied water to residents in newly annexed sections,⁶² in 5 private springs were used,⁶³ in 7 cisterns,⁶⁴ and in 1 both cisterns and springs.⁶⁵

⁶² Camden (15,000 persons supplied under old contract), Denver (312 services), Duluth (piped from 2 wells to 100 families), Harrisburg (to be replaced by city supply), Los Angeles (several companies supply well water), New York (7 companies supply 34 m. g. d. from wells to 300,000 persons in Queens and Brooklyn; quality satisfactory, and city purchasing these when offered at reasonable prices), Pittsburg (two supplies serve 43,000, half in city), Reading (impounded supply, poor quality), Richmond (deep-well system, excellent quality, serves 2,500), Spokane (being replaced by city), Tacoma (good water from 2 springs piped to 10,000 persons).

⁶³ Baltimore (50 per cent bad in 1924), Cleveland (few), Knoxville (50; some polluted), Nashville (many; large number polluted), Omaha.

⁶⁴ Dallas (very few), Dayton (for washing only), Des Moines (few), Evansville (400; for washing only), Kansas City, Kans., Louisville (few), New Orleans (3,000 cisterns).

⁶⁵ Cincinnati (736 cisterns and 29 springs; in 1923, 37 per cent of cisterns and 24 per cent of springs showed *B. coli* in 1 c. c.).

Industrial supplies.—In most cities industrial plants utilized river and private well supplies to a greater or less extent, either alone or with the city water, for general manufacturing purposes, fire protection, boiler, condensing, cooling, hydraulic elevators, and in some cases for drinking. In some cities hotels and office buildings also had their own wells.

Private supplies were reported as not used by industries in 22 cities. A large number of plants had industrial supplies in 38 cities, in 12 of which raw river water was used,⁶⁶ in 17 wells,⁶⁷ in 6 a combination of sources,⁶⁸ and in 3 the source was not given.⁶⁹ A small number of plants had industrial supplies in 39 cities, in 14 of which river water was used, in 13 wells, in 4 several sources, and in 8 the source was not stated. For Reading no information on industrial supplies was given.

Hotels were reported as not using private water supplies in 71 cities; information was lacking for Reading and Spokane; and in the remaining 27 cities⁷⁰ hotels used their own supplies to a greater or less extent for drinking or other purposes, wells constituting the source in every city but Hartford, where water was taken from the river.

The extent to which private industrial and hotel supplies were used for drinking was reported as extensive or considerable in 16 cities (in 6 of which they were so used only by industrial plants,⁷¹ in Dallas and Denver only by hotels or office buildings, and in 8 cities by both industries and hotels),⁷² slight in 15 cities (in 6 of which they were so used only by industries, in 4 only by hotels or office buildings, and in 5 by both), not at all in 66 cities, and for 3 cities no information was given.⁷³

The quality of the water from private supplies used by industries, hotels, and office buildings was reported as poor (or "bad," "polluted," "questionable," or "unsatisfactory") in 37 cities, fair (or "generally good," or "usually safe") in 11, good (or "excellent")

⁶⁶ Baltimore, Detroit, Hartford, Lawrence, Lowell, Lynn, Manchester, Minneapolis, Savannah, Springfield, Troy, Youngstown.

⁶⁷ Albany, Columbus, Fort Wayne, Fort Worth, Houston, Jacksonville, Kansas City, Kans., Memphis, Newark, New Haven, New York, Oakland, Oklahoma City, Peoria, San Francisco, Seattle, Tacoma.

⁶⁸ Chicago (wells, river, lake), Cleveland (river, lake), Knoxville (wells, creek), New Bedford (wells, river), New Orleans (river, wells, canal), Philadelphia (wells, rivers).

⁶⁹ Akron, Kansas City, Mo., Utica.

⁷⁰ Birmingham, Canton, Columbus, Dallas, Denver, Des Moines, Fort Wayne, Fort Worth, Hartford, Houston, Indianapolis, Jacksonville, Memphis, Minneapolis, New Orleans, Oakland, Oklahoma City, Omaha, Peoria, Philadelphia, Pittsburgh, San Antonio, San Francisco, Savannah, Sioux City, South Bend, Wilmington.

⁷¹ Columbus (2 per cent of population), Dayton, Kansas City, Kans. (about 9,000 persons), New Haven, St. Joseph (some), Tacoma (about 2,000 persons).

⁷² Fort Wayne (about 20,000 persons), Fort Worth, Houston, Jacksonville, Memphis (2 per cent of population), Oklahoma City, Sioux City, South Bend (about 25,000 persons).

⁷³ Albany, New York, Reading.

or "safe") in 21, unknown in 12, and in the remaining 19 cities no private supplies were used by either industries or hotels.⁷⁴

Where private industrial supplies were used extensively for drinking, their quality as a rule was reported as good, exceptions being Fort Worth where the quality was doubtful, Columbus, Dayton, and New Haven fair, Dallas and Tacoma not known.

Bottled water.—Only 7 cities were reported as not using any bottled water,⁷⁵ and for 7 no information was given.⁷⁶ In 50 cities the extent used was slight (or "little," "negligible," or "limited"), and in the remaining 36 the use was extensive (or "considerable," "general," or "moderate").⁷⁷

The source of bottled waters used in 37 cities was springs, either local or out of town, in 11 cities distilled or treated city water,⁷⁸ in 8 deep wells,⁷⁹ in 20 two or more different sources, and in 17 the source was not known.⁸⁰

The quality of bottled waters was reported as good (or "excellent," "sterile," "satisfactory," or "safe") in 60 cities, fair (or "mostly good," "usually good," or "occasionally bad") in 7,⁸¹ poor (or "suspected" in 2,⁸² and not stated in 24.⁸³

Supervision.—In view of the importance of safe water, too little attention was generally paid to private supplies by the health authorities. Systematic inspection and periodic sampling of private wells used for domestic purposes were rare, and of industrial supplies even less frequent. Supervision of bottled waters, however, was quite generally practiced, very often by the State health department.

Of the 71 cities where private wells were used for domestic purposes, these were inspected and sampled by the city health department in 49 cities, by the State health department in 2 (Duluth and

⁷⁴ Atlanta, Bayonne, Buffalo, Erie, Evansville, Grand Rapids, Los Angeles, Louisville, Norfolk, Providence, Richmond, Rochester, St. Louis, San Diego, Schenectady, Scranton, Tulsa, Washington, Yonkers.

⁷⁵ Allentown, Portland, Schenectady, Seattle, South Bend, Springfield, Trenton.

⁷⁶ Albany, Flint, Grand Rapids, Newark, Troy, Utica, Washington.

⁷⁷ Bayonne, Birmingham, Buffalo, Chicago, Cincinnati, Dallas, Dayton, Denver, Fort Wayne, Hartford, Jacksonville, Jersey City, Kansas City (Mo.), Knoxville, Lawrence, Los Angeles, Lynn, Milwaukee, Nashville, New York, Norfolk (500,000 gallons in 1924), Oakland, Oklahoma City, Omaha, Paterson, Peoria, Philadelphia, Pittsburgh, San Francisco, Scranton, Somerville, Tulsa (75 per cent of population), Wichita, Wilkes-Barre, Youngstown, Yonkers.

⁷⁸ Cincinnati, El Paso, Evansville, Houston, Nashville, Omaha, St. Louis, San Diego, Syracuse, Tacoma, Youngstown.

⁷⁹ Canton, Dallas, Denver, Des Moines, Fort Worth, Kansas City (Kans.), Oklahoma City, Savannah.

⁸⁰ Akron, Albany, Flint, Grand Rapids, Hartford, Los Angeles, Newark, New Haven, Peoria, Rochester, St. Joseph, San Antonio, Sioux City, Toledo, Troy, Utica, Washington.

⁸¹ Buffalo, Dallas, Dayton, Des Moines, Fort Wayne, Indianapolis, Minneapolis.

⁸² Oakland ("suspected"), Tulsa (10 per cent poor).

⁸³ Akron, Albany, Camden, Duluth, Flint, Grand Rapids, Kansas City (Mo.), Los Angeles, Louisville, Newark, Peoria, Reading, Rochester, St. Joseph, St. Louis, San Antonio, Sioux City, Spokane, Tacoma, Toledo, Troy, Utica, Washington, Yonkers.

Minneapolis), not at all in 18,⁸⁴ and for Albany and Utica there was no information. Of the cities in which supervision of wells was practiced, inspection and sampling were reported as periodic in 9,⁸⁵ occasional in 15, on request or complaint or suspicion in 17, and for 9 the frequency was not stated.⁸⁶ Of the 18 cities where the private wells received no attention, in 5 they were reported used by so many persons (i. e., by more than 1 per cent of the population) as to warrant close supervision;⁸⁷ in the other 13 they were used by less than 1 per cent of the population—enough, however, to deserve some supervision.

Private supplies for domestic use, other than wells, were reported as receiving supervision in 15 of the 24 cities having such supplies, and for Omaha information was lacking. In 10 cities these supplies were inspected and sampled by the city health department,⁸⁸ in 2 (Duluth and Reading) by the State health department, in 2 (New York and Pittsburgh) by the city water authorities, and in Los Angeles by the board of public utilities. Of the 8 such supplies receiving no supervision, 2 (Harrisburg and Spokane) were being replaced by city water, and the other 6 were cisterns, largely used for washing only, except in the case of New Orleans.⁸⁹

Private supplies used by industries and hotels were reported as receiving supervision in 29 cities, while for Albany there was no information. In 16 cities supervision was by the city health department,⁹⁰ in 4 by the city water authorities,⁹¹ in 3 by both of these agencies,⁹² in 2 (Camden and Minneapolis) by the State health department, in 2 (Sioux City and Tacoma) by both local and State health departments, and in 2 (Kansas City, Kans., and St. Joseph) the United States Bureau of Animal Industry controlled the water

⁸⁴ Atlanta, Camden, Chicago, Cleveland, Elizabeth, El Paso, Erie, Flint, Hartford, New York, Norfolk, Reading, San Antonio, Scranton, South Bend, Spokane, Syracuse, Youngstown.

⁸⁵ Cincinnati (semiannually), Dayton (at least annually), Detroit (semiannually), Louisville (monthly), Minneapolis (semiannually), Omaha (not often), Philadelphia, San Diego (semiannually), Toledo.

⁸⁶ Akron, Duluth, Jersey City, Kansas City (Mo.), Oklahoma City, Paterson, St. Joseph, Washington, Wichita.

⁸⁷ Flint (estimated 18 per cent), Norfolk (about 5 per cent), San Antonio (2 per cent), South Bend (estimated 13 per cent), Youngstown (10 per cent).

⁸⁸ Baltimore (annually), Camden, Cincinnati (semiannually), Cleveland (semiweekly), Denver (on request), Kansas City (Kans.), Knoxville (on request), Nashville (on suspicion), Richmond (irregularly), Tacoma.

⁸⁹ Dallas, Dayton, Des Moines, Evansville, Louisville, New Orleans (about 5 per cent of population).

⁹⁰ Dallas (examined on request), Dayton (2 to 3 inspections a year), Denver (occasional inspection), Fort Wayne (occasional analyses), Houston (a few samples), Indianapolis (very little), Jersey City, Memphis (incomplete), Milwaukee (as required), Newark (inspected and sampled annually), Oakland (limited), Oklahoma City (limited), Philadelphia (examined on complaint), San Francisco (very little), Savannah, Wichita.

⁹¹ Columbus, Hartford, Portland, Trenton.

⁹² Fort Worth (a few), Manchester, New Orleans (cross connections inspected).

in packing plants. Among the private industrial and hotel supplies reported receiving no supervision whatever were 2 (New Haven and South Bend) which were used extensively for drinking, and 5 which were used slightly.⁹³

Of the 86 cities reported as using bottled waters, these supplies were under the supervision of the local health department in 31 cities, the State health department in 21, both in 3, the State food and drugs department in Hartford, no official agency in 29,⁹⁴ and for Toledo there was not information. The greater frequency of State supervision of bottled waters than of other private supplies was often due to the location of the source outside the city. Inspection and sampling of bottled waters were described as complete or frequent in 17 cities,⁹⁵ occasional in 18, rare in 3,⁹⁶ and were not specified in 18. Six of the bottled supplies receiving no supervision were used extensively,⁹⁷ the remaining 23 slightly.

Abolition of private supplies.—City ordinances or State laws or regulations enabled most cities to cope with undesirable private supplies. In some cases such supplies could be condemned if found polluted; a few cities had no special provisions but could declare them a nuisance or could invoke their broad powers of protection of the public health, while in others they could be closed only when the public supply became available. A number of cities claimed to have no legal means of abolishing private supplies. One health officer reported plugging wells by bluff.

According to the practice reported, abolition of private supplies in 23 cities was by condemnation if found polluted,⁹⁸ in 31 they were abolished (probably abandoned voluntarily by the owner in many cases) as the public mains were extended,⁹⁹ for 5 there was no information,¹ and the other 41 cities made not attempt to abolish

⁹³ Cincinnati, El Paso, Omaha, Peoria, San Antonio.

⁹⁴ Akron, Camden, Canton, Cleveland, Des Moines, Duluth, El Paso, Evansville, Fall River, Fort Worth, Houston, Kansas City (Mo.), Louisville, Manchester, Omaha, Peoria, Providence, Rochester, St. Joseph, St. Louis, San Antonio, Sioux City, Spokane, Syracuse, Tacoma, Wilkes-Barre, Wilmington, Yonkers, Youngstown.

⁹⁵ Bridgeport, Buffalo (monthly), Cincinnati (monthly by bottling company's chemist), Dayton, Elizabeth, Erie, Fort Wayne, Harrisburg, Hartford, Indianapolis (city, little; State, closely), Jacksonville (bimonthly), Jersey City, Memphis (ample), Minneapolis, Oklahoma City (monthly and results published), Philadelphia (periodic), Scranton (constantly checked).

⁹⁶ Los Angeles, Oakland, Salt Lake City.

⁹⁷ Kansas City (Mo.), Omaha, Peoria, Wilkes-Barre, Yonkers, Youngstown.

⁹⁸ Canton, Columbus, Cleveland, Denver, Des Moines (not much), Evansville, Indianapolis, Kansas City (Kans.), Louisville, Memphis, Milwaukee, Minneapolis, Nashville, New Haven, Oakland, Oklahoma City, Pittsburgh, Savannah, Sioux City, Springfield, Toledo, Washington, Waterbury.

⁹⁹ Akron, Baltimore, Birmingham, Bridgeport, Buffalo, Cincinnati, Dayton, Detroit, Duluth (must connect with sewer, hence get water), El Paso, Fort Wayne, Harrisburg, Hartford, Jersey City, Kansas City (Mo.), Manchester, New Orleans, New York (by purchase), Norfolk, Philadelphia, Reading (by purchase), Richmond, St. Joseph, Salt Lake City, Scranton, South Bend, Spokane, Syracuse, Tacoma, Tulsa, Wichita.

¹ Albany, Atlanta, Dallas, Paterson, Utica.

private supplies. In the last group were 4 cities in which private domestic or industrial supplies of poor quality were used extensively for drinking.²

PROGRESS IN WATER-SUPPLY PRACTICE SINCE 1920 SURVEY

By comparing the information obtained in the present survey (as of 1923) with that of 1920 it has been possible to discover many changes in the water-supply practice of the 83 cities included in both surveys. Only where changes were definitely shown by the surveys are they enumerated below. Hence some changes that have occurred are undoubtedly omitted for lack of information.

Supervision by local health department.—In 10 cities where the local health department had had no connection with laboratory examination of the public supply in 1920, in 1923 it made all water analyses in 4,³ check analyses in 5,⁴ and received copies of the examinations in 1 (Kansas City, Mo.).

Supervision of protective measures for the public supply had been assumed by 3 local health departments and abandoned by 1 since 1920. In Cleveland and Milwaukee the health department now (1923) controlled chlorination and in Newark it inspected its watershed, but in Scranton the health department had dropped its shed inspection.

Protection.—Twenty cities had completed improvements in the protection of their water since 1920. By 1923, 3 cities had instituted sanitary control of their watershed.⁵ Rapid sand filters had been placed in operation in 6 cities,⁶ slow sand filters in 2,⁷ and the old plants had been replaced with new rapid sand filters in 2 (Atlanta and Oklahoma City). Five supplies formerly unchlorinated were now chlorinated, 2 completely (Reading and San Francisco) and 3 partially,⁸ while 2 supplies (Los Angeles and Memphis), formerly chlorinated only in part or at certain times, were now completely chlorinated.

Improvement of the water supply was under way in 15 other cities in 1923. Three of these were enlarging or replacing their source of supply,⁹ 2 were installing filters for the first time,¹⁰ 1 was replacing its old plant with new filters,¹¹ and 4 were increasing their

² Flint (domestic), Fort Worth (domestic and industrial), Knoxville (domestic), Youngstown (domestic).

³ Canton, San Diego, Seattle, Spokane.

⁴ Baltimore, Columbus, Los Angeles, Toledo, Washington.

⁵ Akron, Birmingham, Paterson.

⁶ Birmingham, Cambridge, Detroit, Memphis, Omaha, St. Paul.

⁷ Hartford, New Haven (for one-third of the supply).

⁸ Canton (in emergency), Schenectady (occasionally), Washington (only when needed).

⁹ Camden (adding 8 m. g. d. to wells), South Bend (adding 10 m. g. d. to wells), Tulsa (new impounded supply to replace river).

¹⁰ Buffalo (160 m. g. d. rapid sand), Richmond (50 m. g. d. filters).

¹¹ Denver (new 64 m. g. d. filters, also other improvements).

filter capacity, in addition to other improvements.¹² Los Angeles was installing new chlorine units, and Troy has since (in 1925) started chlorine treatment of all water. Two cities were acquiring additional reservoir capacity.¹³ St. Joseph was replacing hypochlorite with liquid chlorine.

In addition, 9 cities were reported to have been contemplating improvements to the water supply. Four of these planned to augment their source of supply,¹⁴ 3 were to enlarge their filter capacity,¹⁵ and 2 (Boston and Somerville) were considering chlorination.

TABLE III.—*Summary of changes in water-supply practice from 1920 to 1923*

Item	Number of cities improved			Number of cities retrogressed		
	Consid- erably	Slightly	Total	Consid- erably	Slightly	Total
Supervision by local health department:						
Of laboratory examinations.....	9	1	10			
Of protection.....			3			1
Protection and treatment:						
Completed.....	11	9	20			
Under way.....	4	11	15			
Contemplated.....	4	5	9			
Frequency of bacterial examinations.....	3	5	8		4	4
Bacterial quality (measured by <i>B. coli</i>)...	8	8	16	3	5	8
Consumption:						
Per cent of population using public supply.....	17	7	24			
Per cent of services metered.....	13	11	24			

Laboratory control.—The frequency of bacteriological examination of the public supply was reported to have been changed in 12 cities since the 1920 survey, in 8 to a higher and in 4 to a lower frequency.

Two supplies (Canton and Oklahoma City) formerly reported (in 1920) as never undergoing routine analysis were now (1923) sampled daily. Of 3 supplies formerly sampled monthly, 1 (Cambridge) was now examined thrice daily, 1 (Houston) semi-weekly, and 1 (San Francisco) weekly. Of 2 formerly sampled weekly, 1 (Seattle) was now analyzed thrice weekly, the other (Salt Lake City) semiweekly. Syracuse had changed from semiweekly to daily examinations.

¹² Baltimore (adding 112 m. g. d. rapid sand filters and 20 m. g. clear water basin; considering additional 23,000 m. g. impounding reservoir to supply metropolitan district), Erie (adding 8 m. g. d. rapid sand), Flint (adding 12 m. g. d. rapid sand, and building 2,000 m. g. reservoir), Kansas City, Kans. (enlarging plant).

¹³ Cleveland (additional 80 m. g.), Columbus (additional 5,000 m. g.).

¹⁴ Dayton (surveys under way to increase wells, pumps, and reservoir and install softening plant), Fall River (contemplating additional supply from Long Pond), Lawrence (legislation pending to enable addition from less polluted source), St. Paul (river supply to be added).

¹⁵ Kansas City, Mo., (bids in for new system including 100 m. g. d. filters), Knoxville (will provide storage and enlarge filters to 15 m. g. d. in about two years; had just replaced hypochlorite with liquid chlorine), Milwaukee (filter plant contemplated, estimated cost \$5,000,000).

TABLE IV.—Some important details of water supply practice in 100 cities, 1923

City	Public water supplies				Protection and quality							Consumption			Private wells		Other	
	Historical			Super- vision by city health depart- ment	Source of supply	Protec- tion and treat- ment	Per cent of samples showing <i>B. coli</i> in 10 c. c., treated	Num- ber of bacteri- ological exami- nations per month	Cross connec- tions with other sup- plies	Per cent of popu- lation using	Num- ber of gal- lons daily per con- sumer	Per cent of serv- ices me- tered	Per cent of popu- lation using	Type and quality	Super- vision	Industrial and hotel supplies	Bottled water	
	Owned by—	Date present supply installed	Date purifi- cation begun															Date disin- fection begun
Akron	C	x 1873	1914	1915	r	I	thmu	0.05	30	Y	90	87	100	10a	wG	H	EB	Q
Albany	C	1880	1899	1909	j	RL	msuT	1.54	30	x	99	194	50	0.8	xx	x	E	H
Allentown	C	1893	N	1912	j	U	u	0	30	N	99	125	1.5	0	N	N	SB	N
Atlanta	C	1915	x	1917	k	I	thmu	0	30	N	98	120	100	S	wx	N	N	QGD
Baltimore	C	1886	1910	1911	k	I	thmu	0.93	30	Y	97	128	14	S	dwB	Hc	EB	QGD
Bayonne	P	1891	1903	1910	r	R	thmu	4.3	30	Y	100	180	100	0	N	N	N	AGD
Birmingham	P	1848	1903	1912	k	I	thmu	0	16	N	90	100a	100	9.7	wB	Hi	SB	AGH
Boston	T	1853	N	N	N	I	th	10a	4	N	100	115	74	0	N	N	S	QGD
Bridgeport	P	1827	N	1907	k	I	th	3.3	2	YV	98	163	24	1.7	wB	Hi	SB	QGHp
Buffalo	C	1865	NT	1914	k	L	u	2-5q	30	N	100a	227	12	S	wG	Hc	N	AFHp
Cambridge	C	1897	1923	1923	N	I	thmu	0	30	Y	85-90	112	48	0	N	N	S	QGD
Camden	C	1870a	N	N	N	U	N	0	S	Y	99	124	6T	S	dG	N	SGD	Q
Canton	C	1852	N	1922	j	U	v	3.47	30	Y	99	150	100	1a	dG	Hc	EQF	QGH
Chicago	C	1821	N	1912	ju	L	u	16	30	Y	99a	275	10a	S	dwx	N	EB	AGH
Cincinnati	C	1856	1907	1911	k	L	thmu	4.4	30	N	95a	115	100a	0.1	dG, wB	Hp	SQG	AGHp
Cleveland	C	1908	1919	1911	ku	R	muT	20-30q	30	N	100a	154	98	S	wG	N	EB	QGH
Columbus	C	1880	1908	1908	k	R	thmu	6.4	30	N	98	94	99	S	dG	Hc	EAFW	QGH
Dallas	C	1914	1913	1914	k	I	MT	5.2-6.7	30	Y	96	75	100	0.5	wF	Hc	EAFHc	AFH
Dayton	C	1904a	N	1914	j	U	thmsuT	0	30	N	85	125	82	15	dB	Hp	SAFHp	AGH
Denver	C	1871	1880	1910a	N	I	u	S	30	N	96	207	20a	0.44	wB	Hc	SAGHi	QF
Des Moines	C	1884	N	1910	k	U	u	0	30	N	80a	85	100a	20a	dB	Hp	SQG	QGHp
Detroit	C	1825	1923	1913	k	R	tu	0.09	30	Y	99	132	99	S	wx	Hp	EB	QGHp
Duluth	C	1883	N	1911	k	L	tu	0	30	Y	95	96	79	5	wB	D	S	Q
Elizabeth	C	1903a	1909a	1909a	k	U	MT	S	30	Y	99	165	75a	0.1	wB	N	SQF	QGHp
El Paso	P	1905	N	N	j	U	N	5	2	Y	99.7	72	100	0.3	wB	N	S	QGHp
Erie	C	1867	1913	1911	N	L	mu	0	30	N	99	205	3	S	wx	N	N	QGHp
Evansville	C	1876	1912	x	N	R	mu	13.9	30	N	90	100	93	1	dG	Hi	N	QGH
Fall River	C	1874	N	N	N	L	th	S	T	N	100	58	100a	0	N	N	SB	QGH
Flint	C	1913	1913	1913	N	R	mu	9.6	30	N	82	112	100	18a	xB	N	S	QGH
Fort Wayne	C	1879	N	N	N	U	mu	0	4	N	85a	77a	100	15a	dG	Hi	EAG	AFHp
Fort Worth	C	1914	1912	1912	N	L	thmu	22.6T	30	Y	90a	65a	x	10a	dB	Hi	EABHW	QGH
Grand Rapids	C	1913	1913	1913	N	R	munT	1-5q	30	N	100	115	100a	0	N	N	N	x

Harrisburg.	1843	1905	1909	N	R	thsvnt	mu	0	30	Y	98	135	74	0	dG, wF	N	N	QGDp
Hartford.	1867	1918	1913	rh	I	U	thsvnt	0.55	30	N	99.9	94	100	0.1	dG	N	N	AGTp
Houston.	x	N	N	j	U	U	thsvnt	S	8	Y	90	83a	100a	S	dwFGT	H	H	QGH
Indianapolis.	1871	1904	1910	k	U	U	thsvnt	2.6	30	YV	70a	145	55	30a	dwFGT	Hi	Hi	QFHDp
Jacksonville.	1880	1916T	1916	j	U	U	thsvnt	S	30	Y	90	94	97	x	dG	Hc	Hc	AGDp
Jersey City.	1902	1902	1902	k	I	U	thsvnt	3	30	Y	100a	130	32	S	wG	H	H	AGHP
Kansas City,	1890	1890	1912a	N	R	mu	mu	0.055	30	Y	80	185	90a	20a	dwF	Hi	Hi	QGDp
Kans.																		
Kans.																		
Mo.	1875	1875	1910	r	R	gu	gu	7	30	Y	99a	132	80	x	dwB	H	H	A
Knoxville.	1883	1894	1894(?)	k	R	mu	mu	0.4	30	Y	97	78	90	3a	xB	Hc	Hc	AGHi
Lawrence.	1893	1893	1918	N	R	su	su	30	8	YV	100	45	97	0	N	N	N	AGDi
Los Angeles.	1902	1902	1914	k	IU	MT	MT	10-15q	30	N	98	105	91	x	xF	Hc	Hc	Q
Louisville.	1860	1909	1908a	N	R	tmu	tmu	6q	30	N	90	148	13	x	wF	Hp	Hp	QGD
Lowell.	1915T	1915T	N	N	R	nT	nT	0	0T	N	100	55	89	0	N	N	N	AGD
Lynn.	1870	N	N	N	I	th	th	0	2	Y	100	78	80	0	N	N	N	QGH
Manchester.	1874	N	N	N	L	th	th	3.8	2	YV	98a	67	83	2a	dwG	Hc	Hc	QGH
Memphis.	1890	1924T	1921	k	U	unT	unT	0	30	N	97	85	100a	2a	dG, wB	Hc	Hc	QGH
Milwaukee.	1874	N	1910	ru	L	u	u	23.6	30	N	99.9	131	100	0.1	dwG	Hi	Hi	AGHi
Minneapolis.	1868	1913	1910	N	R	mu	mu	0.3	30	N	90	115	100	1a	dB	Dp	Dp	QFDP
Nashville.	1899	1907	1907	j	R	tgu	tgu	0	30	N	80-90	101	91	10-20	dB	Hc	Hc	AGH
Newark.	1892	1892	1912a	kh	U	th	th	10.2	30	Y	100	95	74	0	N	N	N	x
New Bedford.	N	N	N	N	L	th	th	0	30	YV	100	77	95	0	N	N	N	QGD
New Haven.	1907	1907	1911	rh	I	MT	MT	0	30	Y	100	120	40	0	N	N	N	QGD
New Orleans.	1909	1909	1909	k	R	mu	mu	0.5	30	YV	95	120	100a	0	N	N	N	QGH
New York.	x	N	1910a	kh	IU	MnT	MnT	0.07	30	Y	92a	147	30a	S	xx	N	N	AGH
Norfolk.	x	N	1907	kh	L	thmu	thmu	9	30	N	95a	80	95	5a	dF	N	N	AGD
Norfolk.	1919	{ 1881-1887	1913	kh	UI	MT	MT	x	30	YV	97a	62a	97a	4a	dF, wB	Hc	Hc	ABH
Oakland.	1865	1887	1913	kh	UI	MT	MT	x	30	YV	99	72a	100	x	dG	H	H	AGHP
Oklahoma City.	1908a	1908	x	k	I	tmu	tmu	x	30	Y	99	72a	100	x	dG	H	H	AGHP
Omaha.	1889	1889	1910	N	R	mu	mu	0	30	YV	90a	136	97	10a	wF	Hp	Hp	AG
Paterson.	1898	1902	1911	r	I	thmu	thmu	0	30	Y	99.7	104	100	0.3	wB	H	H	AGD
Peoria.	1889	N	1923	N	U	u	u	0	30	N	80-90	88	71	x	wx	Hc	Hc	A
Philadelphia.	1889	1912	1913	r	R	msuT	msuT	9.3	30	N	95	177	26	0.5	wF	Hp	Hp	AGHP
Pittsburgh.	1824T	1908	1910	k	R	su	su	0	30	Y	93	243	41	0.5	dW	Hi	Hi	AGHP
Portland, Oreg.	1894	N	1917	j	I	th	th	0	1	N	100	123	40	0	N	N	N	AGHi
Providence.	1871	1905	1917	N	I	thsu	thsu	41T	30	N	100	86	96	0	N	N	N	N
Reading.	1821	1903	1921	N	UI	thsu	thsu	3.0	30	N	98a	160	76a	S	xB	N	N	QGD

q—Estimated equivalent of data reported in other terms or dilutions; for latter see text.
r—Receives copies of analyses made elsewhere.
s—Slow sand filter.
t—Storage for 3 days or longer.
u—Complete chlorination.
v—Partial or emergency chlorination.
w—Shallow wells.
x—No data.

s—Coagulation.
h—Sanitary control of watershed.
i—Irregular or occasional inspection and sampling.
j—Makes all analyses.
k—Makes check analyses.
m—Mechanical or rapid sand filters, including coagulation.
n—Treatment other than for improving sanitary quality.
p—Periodic inspection and sampling.

P—Private company.
Q—Used slightly for drinking.
R—Open rivers.
S—Slight, few, or small.
T—See text for details.
U—Underground.
V—Double-check valves used.
W—Supervised by city water authorities.
Y—Yes.
a—Approximate.
c—Inspection and sampling on complaint or suspicion.
d—Deep wells.

A—Used extensively for drinking.
B—Bad or poor quality.
C—City.
D—Supervised by State health department.
E—Extensive or many.
F—Fair quality.
G—Good quality.
H—Supervised by city health department.
I—Impounded streams.
L—Lakes.
M—Mixed.
N—No or none.

	1827	1892	1911	I	thmsuT	10-20q	30	N	100a	120	86	S	QF	QGD	AG
Wilmington-----	C	1892	1911	I	thmsuT	10-20q	30	N	100a	120	86	0	SB	QGD	AG
Worcester-----	C	1892	1911	I	thmsuT	10-20q	30	N	100a	120	86	0	SB	QGD	AG
Yonkers-----	C	1892	1911	I	thmsuT	10-20q	30	N	100a	120	86	0	SB	QGD	AG
Youngstown----	C	1892	1911	I	thmsuT	10-20q	30	N	100a	120	86	0	SB	QGD	AG

q—Estimated equivalent of data reported in other terms or dilutions; for latter see text.
r—Receives copies of analyses made elsewhere.
s—Slow sand filter.
t—Storage for 3 days or longer.
u—Complete chlorination.
v—Partial or emergency chlorination.
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 L—Lakes.
 M—Mixed.
 N—No or none.

Of 3 supplies formerly reported as analyzed daily, the frequency had been reduced to weekly in 2 (Boston and Somerville), and to thrice weekly in 1 (Denver). Spokane had changed from weekly to monthly examinations.

Bacterial quality.—In 1923 the bacterial quality of the finished water, as measured by the *B. coli* content reported, had improved in 16 cities and deteriorated in 8 as compared with 1920. The improvement was considerable in 8 cities,¹⁶ and slight in 8.¹⁷ The deterioration was considerable in 3 cities,¹⁸ and slight in 5.¹⁹ In many cases the difference in quality is explainable by changes in the protection practice, such as the addition or the overloading of filters, the adoption or increased dosage of chlorination, and increased or diminished watershed control.

Consumption.—The proportion of the population using the public supply was reported to have increased in 24 cities. On the basis of these reports, it is estimated that approximately 1.5 per cent less of the population of the 83 cities included in both surveys were using private supplies in 1923 than in 1920. The increase in the percentage of the total population using the public supply was reported as over 15 in Oklahoma City, between 10 and 15 in 4 cities,²⁰ between 5 and 10 in 12 cities,²¹ and less than 5 per cent in 7 cities.²²

Extension of mains, improvement in the quality of the public supply, and the closing of unsafe private supplies were responsible for the more widespread use of city water.

Twenty-four cities had a greater proportion of their services metered in 1923 than in 1920. In 4 cities the increase amounted to between 20 and 30 per cent of all services,²³ in 9 between 10 and 20 per cent,²⁴ and in 11 less than 10 per cent.²⁵

SUMMARY

Public water supplies were privately owned and operated in only 16 of the 100 largest cities in 1923.

In most cities the local or State health department made all laboratory examinations or ran check analyses. Few health depart-

¹⁶ Akron, Baltimore, Detroit, Nashville, Omaha, Reading, San Francisco, Youngstown.

¹⁷ Albany, Dallas, Des Moines, Kansas City (Kans.), Louisville, Minneapolis, New Haven, New Orleans.

¹⁸ Chicago, Providence, Tacoma.

¹⁹ Buffalo, Columbus, Flint, Fort Worth, Richmond.

²⁰ Duluth, Jacksonville, Kansas City, (Kans.), St. Paul.

²¹ Cleveland, Columbus, Denver, Grand Rapids, Nashville, Oakland, Reading, Salt Lake City, San Antonio, Savannah, Toledo, Washington.

²² Dallas, Milwaukee, New Bedford, St. Louis, Scranton, Spokane, Utica.

²³ Elizabeth, Norfolk, Reading, Worcester.

²⁴ Akron, Baltimore, Canton, Denver, Kansas City (Kans.), Lynn, New Haven, Salt Lake City, San Antonio.

²⁵ Albany, Indianapolis, Kansas City (Mo.), Lawrence, Minneapolis, Nashville, New York, Omaha, Providence, Savannah, Schenectady.

ments, however, deemed it necessary to exercise active control over protection and treatment.

Over two-thirds of the cities used surface waters exclusively. Only eight supplies received no treatment, and these were all from wells. Nearly half the cities employed filtration as the major treatment, and 81 supplies were chlorinated either constantly or partially. Technical supervision of treatment was the rule.

Over two-thirds of the supplies were analyzed daily or oftener. All but eight were examined at least monthly, and these were impounded or well supplies receiving no treatment. Practically all water laboratories followed the A. P. H. A. standard methods.

A few public supplies were of doubtful quality, but the vast majority showed the colon group present in 10 c. c. samples of finished water less than 10 per cent of the time.

There were still 11 cities in which less than 90 per cent of the population used the public supply. In six cities the population accessible to the public supply was much greater than that using it, and further attempts to abolish private supplies of questionable quality are warranted.

Outskirts and newly annexed sections of most cities had some private supplies for domestic use. In nearly all cities large industries or hotels used their own supplies, sometimes for drinking. Practically all cities consumed some bottled water. Nearly a million residents of the 100 cities used private well water for domestic purposes, and half of these well supplies were of poor quality. Too little attention was generally paid to private supplies by the health authorities.

Since the 1920 survey considerable progress had been made in water supply practice by a number of cities.

XVII. SEWAGE AND EXCRETA DISPOSAL

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PUBLIC SEWERAGE SYSTEMS

Historical.—For 10 of the 100 cities surveyed in the spring of 1924 definite information is lacking as to when the present public sewerage system was installed or begun. Of those known, the earliest was in Harrisburg, reported to have been started about 1800, and in Philadelphia and Rochester, about 1824. The others were reported as follows:

Date of installation of present system

Decade	Number cities	Cities
1830-1839	3	Hartford, Lowell, Troy.
1840-1849	7	Buffalo, Cambridge, Detroit, Fort Wayne, New York, Somerville, Utica.
1850-1859	14	Camden, Chicago, Cincinnati, Cleveland, Evansville, Grand Rapids, Kansas City, Mo., Lawrence, Louisville, Newark, New Bedford, Oakland, Paterson, San Francisco.
1860-1869	3	Milwaukee, Pittsburgh, St. Paul.
1870-1879	19	Bayonne, Dayton, Fall River, Jacksonville, Jersey City, Lynn, Minneapolis, Nashville, New Haven, Norfolk, Portland, Providence, Scranton, Sioux City, South Bend, Springfield, Washington, Yonkers, Youngstown.
1880-1889	21	Akron, Atlanta, Boston, Canton, Denver, Des Moines, Duluth, Fort Worth, Kansas City, Kans., Manchester, Memphis, Omaha, St. Joseph, San Diego, Spokane, Syracuse, Tacoma, Trenton, Waterbury, Wichita, Wilkes-Barre.
1890-1899	11	Elizabeth, Flint, Knoxville, Los Angeles, Oklahoma City, Reading, Salt Lake City, San Antonio, Savannah, Seattle, Worcester.
1900-1909	7	Baltimore, Birmingham, Bridgeport, Columbus, Houston, New Orleans, Tulsa.

The latest installations were those of Dallas in 1914 and of Allentown in 1921. In some of the cities where the present sewerage system has been constructed during recent decades, preexisting sewers were abandoned or torn up or else tied into the new system.

Ownership and operation.—Though private sewerage systems were in use in some cities, in none of the 100 cities was the public sewerage system owned by private corporations, as was sometimes the case with public water supplies. The public sewers were generally operated by the departments of public works, engineering, or streets, and in some cities by various other municipal agencies. In Chicago and Dayton control was vested in a sanitary district established by the State, while in Camden and Cleveland the State health departments exercised control.

Type of sewers.—Combined sewers still served the majority of the population of the 100 cities. The former practice was to install combined sewers to take care of both storm water and house sewage, but in recent decades a decided tendency toward the construction of separate systems has been in evidence, due largely to the growing need of treating domestic sewage to prevent gross pollution of streams.

In 1924, 27 cities reported the use of combined sewers,¹ 22 used separate systems,² and the remainder used combined sewers in some sections (usually the older parts of the city) and separate systems in others. Of the 51 cities using both types, 24 were served mainly by combined sewers,³ 7 mainly by separate systems,⁴ while for the other 20 the proportion was not stated.

Supervision by health department.—In most cities the local health department enforced the installation of house connections to the public sewers. Usually notices were served when sewers were extended, and connections were enforced through the plumbing inspector or the sanitary inspection force. About one-fourth of the health departments seem to have had no control over house connections.⁵

Although only 19 city health departments actually reported the exercise of any control over nuisances arising in connection with the public sewers, it is probable that most health departments occasionally found it necessary to investigate such complaints whether they wished to do so or not.

Population served.—Approximately 86 per cent of the entire population of the 100 cities were actually connected to public sewers in 1923. The number of persons accessible to public sewers was at least 5 per cent greater, leaving about 3,000,000 residents (nearly 10 per cent) of the 100 cities still in need of sewer extensions.

In Fall River and Knoxville about 50 per cent of the population were connected to public sewers, and in Allentown only 24 per cent.

¹ Albany, Camden, Chicago, Cleveland, Elizabeth, Evansville, Fort Wayne, Grand Rapids, Hartford, Jersey City, Manchester, Milwaukee, Minneapolis, Nashville, Paterson, Portland, St. Louis, St. Paul, San Diego, San Francisco, Seattle, South Bend, Spokane, Toledo, Wilkes-Barre, Wilmington, Youngstown.

² Baltimore, Birmingham, Canton, Dallas, Dayton, Denver, El Paso, Flint, Fort Worth, Knoxville, Los Angeles, Memphis, New Orleans, Norfolk, Oklahoma City, Omaha, Reading, Salt Lake City, San Antonio, Schenectady, Tulsa, Waterbury.

³ Atlanta, Cincinnati, Columbus, Des Moines, Detroit, Fall River, Kansas City, (Kans.), Kansas City, (Mo.), Louisville, Lowell, Lynn, Newark, New Bedford, New Haven, New York, Philadelphia, Pittsburgh, Providence, Rochester, St. Joseph, Sioux City, Springfield, Troy, Washington.

⁴ Allentown, Buffalo, Houston, Jacksonville, Trenton, Wichita, Worcester.

⁵ Akron, Allentown, Birmingham, Chicago, Cincinnati, Cleveland, Dayton, Denver, Des Moines, Detroit, Duluth, Evansville, Grand Rapids, Jacksonville, Kansas City, Mo., Milwaukee, Minneapolis, Peoria, Portland, Providence, Springfield, Toledo, Waterbury, Wilkes-Barre.

For Yonkers information was not at hand. The remaining cities reported as follows:

Per cent of population using public sewers, 1923

Per cent connected	Number cities	Cities
99-100	13	Bayonne, Buffalo, Cambridge, Dayton, Elizabeth, Harrisburg, Hartford, Jersey City, Milwaukee, Newark, Somerville, Syracuse, Wilkes-Barre.
95- 98	26	Albany, Chicago, Cleveland, Detroit, El Paso, Fort Wayne, Lawrence, Manchester, Memphis, Minneapolis, New Bedford, Norfolk, Oakland, Paterson, Pittsburgh, Providence, Richmond, Rochester, Salt Lake City, San Francisco, Schenectady, Seattle, Toledo, Utica, Washington, Worcester.
90- 94	16	Akron, Boston, Columbus, Dallas, Duluth, Grand Rapids, Lowell, New Orleans, Omaha, Philadelphia, St. Louis, San Diego, Springfield, Trenton, Troy, Wilmington.
80- 89	15	Atlanta, Birmingham, Bridgeport, Canton, Erie, Fort Worth, Houston, Los Angeles, New Haven, New York (50 to 100 for different boroughs), Oklahoma City, St. Paul, Savannah, Sioux City, Youngstown.
70- 79	12	Baltimore, Camden, Des Moines, Flint, Indianapolis, Kansas City, Kans., Nashville, Peoria, St. Joseph, Scranton, South Bend, Waterbury.
60- 69	14	Cincinnati, Denver, Evansville, Jacksonville, Kansas City, Mo. (also had 50 miles of private sewers), Louisville, Lynn, Portland, Reading, San Antonio, Spokane, Tacoma, Tulsa, Wichita.

In many cities there was a considerable percentage of the population accessible to public sewers but not connected, usually less than 5 per cent, although in 13 cities it amounted to between 5 and 10 per cent.⁶ In the following 9 cities so large a proportion (10 per cent or more) of residents was reported not connected on streets where sewers were available as to warrant further attention to enforce connections: Birmingham, 15 per cent; Evansville, 10; Indianapolis, 15; Kansas City, Kans., 11; Kansas City, Mo., 20; Portland, 10; Reading, 15 to 20; San Antonio, 15; Wichita, 10.

Outside flush closets.—While 25 cities had either eliminated all outside flush closets connected to the public sewers or had never permitted their construction, there were 28 cities in 1923 which reported having a few or less than 500, and 16 cities⁷ in which a large number of such closets was still in use. Twenty-one other cities reported having outside flush closets, but did not state the number, while for the remaining 10 cities there was no information.

In most cities having outside flush closets these were inspected by the health department's sanitary or plumbing inspectors. Some municipal agency other than the health department made the inspections in 10 cities,⁸ in 9 cities outside flush closets received no official inspection whatever,⁹ and for the remaining 11 there was no information regarding inspections. Where inspection was by the

⁶ Akron, Allentown, Cincinnati, Denver, Flint, Los Angeles, Louisville, Lynn, St. Joseph, Savannah, Sioux City, South Bend, Troy.

⁷ Bayonne (3 per cent of all connections), Buffalo (5,000), Cincinnati (3,000-15,000), Detroit, (1,000), Elizabeth, El Paso, Fort Wayne, Knoxville (5 per cent), Memphis (5,000), Nashville, Newark (2 per cent), Omaha (5 per cent), Philadelphia, Savannah (14,000), Trenton (2,500), Wilmington.

⁸ Atlanta, Chicago, Denver, Kansas City (Kans.), Knoxville, Oklahoma City, Omaha, St. Louis, Seattle, Spokane.

⁹ Akron, Allentown, Des Moines, Jacksonville, Milwaukee, Reading, Rochester, Syracuse, Wilkes-Barre.

health department, it was reported as frequent or periodic in 15 cities,¹⁰ occasional or on complaint in 28, and the other 2 (Kansas City, Kans., and Lynn) did not state the frequency.

Some fecal exposure in outside flush closets was reported by most cities having such closets, but 14 cities claimed complete absence of this health hazard.¹¹ Only slight or occasional fecal exposure in outside flush closets was reported by 26 cities, while six admitted it to be more or less of a problem.¹² The other cities with outside flush closets failed to make a statement on this subject.

Sewage treatment.—In 1923 most of the 100 cities discharged their sewage without any treatment. A few cities, such as Somerville, Cambridge, and Fall River, used nothing but coarse screens; 4 treated only a very small percentage of their sewage; 23 cities treated all or a considerable portion of their sewage; and in a number of others treatment plants were under construction or being planned.

TABLE I.—Data on sewage treatment in cities which treated a considerable portion of their sewage, 1923

City	Per cent of sewage treated	Methods	Date installed	Supervision		Condition of plant
				Technical	Laboratory	
Akron.....	33	Ti, Ft.....	1917	Partly.....	Partly.....	Fair.
Albany.....	100	Ti.....	1917	Yes.....	State.....	
Allentown.....	15	Sf, Tp, E.....	1921	Engineer.....	Yes.....	Excellent.
Atlanta.....	80	Tg, Ti, Ft.....	1912	None.....	None.....	Good.
Baltimore.....	100	Sf, Ti, Ft, R, Rd.....	1906-1911	Full.....	Complete.....	New.
Birmingham.....	33	(a) Ts, Fc, R, Rd.....	1912	Yes.....	None.....	Fair.
	67	(b) Ts, Fc, R, Rd.....	1914	Yes.....	None.....	Poor.
Boston.....	100	Sc, Tb.....	1884	Engineer.....	None.....	Good.
Bridgeport.....	90	Sf.....	1919	None.....	None.....	Good.
Canton.....	100	Ti, Fc.....	1917	Part.....	Small.....	Crowded.
Cleveland.....	50	(a) Sc, Tg.....	1922	Yes.....	Yes.....	Not completed
	17	(b) Ti.....	1922	Yes.....	Yes.....	Excellent.
Columbus.....	100	Ti, Ft, Tf.....	1908	Chemist.....	Complete.....	Overloaded.
Dallas.....	100	Ti.....	1914	Superintendent.	Irregular.....	
El Paso.....	100	Tb, R.....	1923	Yes.....	Partial.....	Excellent.
Houston.....	100	A, Rd.....	1917	Yes.....	Yes.....	Good.
Los Angeles.....	2	(a) Sf, Ti.....	1915	City engineer.....	None.....	Good.
	98	(b) Sf.....	1923	City engineer.....	None.....	Good.
New York.....	2	(a) 7 Sf plants.....	1900	Yes.....	Yes.....	Sf good.
	6	(b) 8 Tb plants.....				Tb old.
Philadelphia.....	8	Ti, Ft, Tf, Dh.....	1912	Yes.....	Yes.....	Good.
Providence.....	100	Tp, Dh.....	1901	Yes.....	Yes.....	Good.
Reading.....	80	Sc, Ts, Ft, Tf.....	1898-1917	Part.....	Yes.....	Overloaded.
	82	(a) Sf, Ti, Rd.....	1917	Superintendent.	Yes.....	Excellent.
Rochester.....	4.7	(b) Sf, Ti, Ft, Rd.....	1916			
	1.3	(c) Sf, Ti, Rd.....	1921			
Schenectady.....	100	Ti, Ft.....	1915	Chemist.....	Good.....	Good.
Washington.....	100	Sc, Tb, Sk.....	1908	Sanitary engineer.	Yes.....	Good.
Worcester.....	93	(a) Tp.....	1890	Chemist.....	Yes.....	Poor.
	7	(b) Tb, Fs.....	1898			

A—Activated sludge plant.

Dh—Hypochlorite disinfection.

E—Electrolytic tanks.

Fc—Contact beds.

Fs—Sand filters.

Ft—Trickling filters.

R—Sludge digestion.

Rd—Sludge drying.

Sc—Coarse screens.

Sf—Fine screens.

Sk—Skimming to remove grease.

Tb—Sedimentation basin.

Tf—Final sedimentation.

Tg—Grit chambers.

Ti—Imhoff tanks.

Tp—Chemical precipitation.

Ts—Septic tanks.

¹⁰ Columbus, Flint, Fort Wayne, Houston, Indianapolis, Memphis, Newark, New Haven, Norfolk, Oakland, Richmond, Savannah, Trenton, Wichita, Wilmington.

¹¹ Baltimore, Bayonne, Camden, Flint, Houston, Lynn, New Haven, Oakland, Omaha, Pittsburgh, San Diego, Seattle, Spokane, Wilkes-Barre.

¹² Detroit, Indianapolis (in colored section), Nashville (many complaints), Newark, Savannah, Scranton (in some instances).

TABLE I.—*Data on sewage treatment in cities which treated a considerable portion of their sewage, 1923—Continued*

City	Capacity m. g. d.		Efficiency of treatment	Character of effluent	Cost of treat- ment per m. g.	Remarks
	Rated	Oper- ated				
Akron.....	7.5	8	Fair.....	Fair.....	-----	Additional 30 m. g. d. plant planned.
Allentown.....	1.6	0.75	¹ 42, ² 99.9...	D. O. 6.7.....	³ 65.00	In experimental stage.
Atlanta.....	25	40	Good.....	Good.....	2.10	Old laboratory abandoned.
Baltimore.....	40-90	48.17	¹ 80, ² 94.....	⁴ 85-90.....	³ 6.26	Additions under construction.
Birmingham.....	{ 4 8	6 10	Overloaded Overloaded	⁴ 75-90..... Poor.....	4.50	
Boston.....	-----	100	Poor.....	Poor.....	-----	{ Basins empty second hour of ebb tide. Sedimentation imperfect.
Bridgeport.....	23.2	16	Good.....	Satisfactory.....	³ 24.00	
Canton.....	6	8	Overloaded	Fair.....	6.75	{ Contact beds not operated in winter; plant being re-modeled.
Cleveland.....	{ 96 34	96 34	{ Average for such plants.	Good under conditions. }	2.07	{ Summer chlorination to protect bathing beaches. Operated only 53 per cent of time in 1923.
Columbus.....	20-50	27		⁴ 66.....	2.55	
Dallas.....	5.5	6.5	No record.....	No record.....	.75	Frequently not operated.
El Paso.....	12	5-8	¹ 70.....	Fresh, settled	-----	Tanks alternately used and rested.
Houston.....	15	7.5	⁵ 92.....	⁴ 79-96.....	16.10	
Los Angeles.....	{ 2	1	Satisfactory Satisfactory	Satisfactory Satisfactory	----- 1.50	Serves harbor district. Serves city proper.
New York.....	{ -----	8.75 29.5	{ Solids re- moved.	Fresh.....	12.80	{ Two more screen plants under construction. Ti plant about completed: 60 m. g. d.
Philadelphia.....	2	1.5		Stable.....	25.00	
Providence.....	50	30	¹ 80, ² 90.....	Disinfected.....	-----	
Reading.....	6	6-8	¹ 83, ² 76.....	D. O. 2.3.....	³ 12.22	Additional filter contemplated.
Rochester.....	{ 25 0.8	32 1.2	¹ 50..... Clear.....	Satisfactory Stable.....	----- 7.90	{ Three more plants planned.
Schenectady.....	{ 0.2 8	0.3 8	Fair..... Undigested solids in winter.	Satisfactory -----	----- 12.50	
Washington.....	200	70	No nuisance	Satisfactory.....	4.50	
Worcester.....	{ ----- 4.7	19.2 3.3	⁶ 60..... ⁶ 87.....	Poor..... Fair.....	----- ⁷ 7.93	New plant being built: Ti, Ft, Tf.

¹ Per cent removal of suspended solids.² Per cent removal of *B. coli*.³ Includes disposal.⁴ Relative stability.⁵ Per cent reduction of oxygen demand, 5 days.⁶ Per cent reduction of albuminoid ammonia.⁷ Operating expenses only.

Data on the plants of those cities treating a considerable portion of their sewage are presented in Table I. While the estimated 1923 population of these 23 cities totals 14,165,000, only 12,614,000 were connected to the public sewers, and only 5,629,000 (17.5 per cent of the total population of the 100 cities) contributed to the sewage treated by these plants. The latter figure may be subdivided into two groups according to the degree of purification effected. Thus, in 11 cities ¹³ the sewage from 3,688,000 persons (11.5 per cent of the population of the 100 cities) was treated by plants designed principally to remove, and in certain cases partially to digest, some of the suspended solids, by means of fine screens, settling basins, septic and

¹³ Albany, Boston, Bridgeport, Cleveland, Dallas, El Paso, Los Angeles, New York, Rochester (4.7 per cent of sewage also filtered), Washington, Worcester (7 per cent filtered).

Imhoff tanks, or a combination of these. In 12 other cities,¹⁴ the sewage from 1,941,000 persons (6 per cent of the population of the 100 cities) was treated by filtration or in activated sludge plants, which not only remove most of the suspended solids but to a large extent oxidize the impurities in solution through biochemical processes. Two of these cities (Philadelphia and Providence) attempted disinfection of the effluent with hypochlorite of lime and Cleveland chlorinated in summer to protect bathing beaches.

Four cities treated only a very small portion of their sewage in 1923. Chicago had two small activated sludge tanks and several small settling tanks and trickling filters, but the volume of sewage treated was not reported. About 250 persons in the College Hills suburb of Cincinnati were served by a trickling filter plant. Des Moines had three small septic-tank and Imhoff-tank plants which were to be abandoned upon completion of the new intercepting sewer. A small section of Kansas City, Mo., with a population of 6,000, was served by a plant consisting of settling tanks and contact beds.

Additions or alterations in existing sewage treatment plants were under construction in six cities at the time of the survey.¹⁵ In six other cities new plants were being installed to treat sewage for the first time.¹⁶

Plans for additions to existing plants were being made at the time of the survey in Akron and Reading. In eight other cities, treating none of the sewage, plans for treatment plants were being proposed or had been adopted.¹⁷

Sewage disposal.—Nearly two-thirds of all the cities surveyed discharged raw sewage or the treated effluent into fresh-water streams. In about one-fourth of the cities the sewer outlet was located in tidal water. Ten cities discharged sewage into lakes,¹⁸ although the water supply was frequently taken from the same body of water, particularly in the case of the Great Lakes cities.

¹⁴ Akron, Allentown (electrolytic tanks), Atlanta, Baltimore, Birmingham, Canton, Columbus, Houston, Philadelphia, Providence (hypochlorite disinfection), Reading, Schenectady.

¹⁵ Baltimore, Canton, New York, Philadelphia, Rochester, Worcester.

¹⁶ Fort Worth (sprinkling filters and chlorination; to be finished by May, 1924), Grand Rapids (to be completed in 1928), Indianapolis (50 m. g. d. activated sludge plant expected to be in operation August, 1924), Milwaukee (85 m. g. d. activated sludge plant; dried sludge to be sold), Syracuse (coarse screens and sedimentation; put in operation January, 1925), Tulsa (sprinkling filters, to be ready January, 1925).

¹⁷ Camden (expect plant in next 10 years), Chicago (compelled to begin construction of extensive treatment works in 1925 owing to limited dilution in drainage canal), Detroit (will eventually provide treatment), Erie (plant proposed), Flint (plant planned to be in operation 1927), Oklahoma City (plans made for two sprinkling filter plants), Trenton (plans submitted to State health department disapproved), Troy (must submit plans to State health department by January, 1925).

¹⁸ Buffalo, Cleveland, Detroit, Duluth, Erie, Milwaukee, Rochester, Salt Lake City, San Antonio, Syracuse.

Local nuisances were often created in the vicinity of sewer outlets. These may occur at all times where raw or inadequately treated sewage is discharged into a water course too small to supply sufficient dilution, and were reported especially prevalent in warm weather and during low water. Some of the nuisances complained of were odor, scum, sludge banks, rats, floatage, pollution of shellfish and bathing beaches.

About one-half of the cities claimed to have no local nuisances at their sewer outlets. Thirty-one cities reported only slight or occasional nuisances, while 16 admitted the existence of decided or considerable nuisances.¹⁹ From six cities no statement on this matter was obtained.

Publicly owned comfort stations.—Most cities maintained comfort stations out of public funds, in addition to those made available for public convenience by such private agencies as hotels, theaters, filling stations, and department stores. However, 9 cities reported no publicly owned comfort stations,²⁰ and 11 maintained such stations only in parks.²¹ For Albany and Troy there was no information regarding comfort stations. All other cities had one or more publicly owned stations in the central or business section or in municipal or county buildings, and most of these also maintained such stations in the parks. Most cities supported only one downtown station, a few had two, three, or four, while 9 of the larger cities maintained 5 or more stations in the business districts.²² Eight cities did not state the number of downtown stations.

Cold water, soap, towels, and attendants were provided at publicly owned downtown comfort stations in nearly all cities, and hot water in most of them. Akron furnished none of these services; Lynn had nothing but an attendant; Nashville, Oklahoma City, Paterson, and San Francisco supplied only cold water and attendants; Grand Rapids and South Bend provided neither hot water nor attendants; New York supplied neither soap nor towels; Bayonne and Philadelphia furnished no towels; Flint had no attendant; 10 other cities had no hot water;²³ and the services supplied in Albany and Troy were not stated. Most of the cities that employed attendants at comfort stations either reported only one attendant per station or gave no

¹⁹ Bayonne, Detroit, Fall River, Fort Worth, Indianapolis, Kansas City (Mo.), Lawrence, Lowell, Lynn, New Haven, New York, Oklahoma City, Philadelphia, St. Paul, Toledo, Worcester.

²⁰ Birmingham, Elizabeth, Erie, Fort Worth, New Orleans, Oakland, Peoria, Tulsa, Youngstown.

²¹ Bridgeport, Evansville, Houston, Kansas City (Kans.), Omaha, Richmond, Savannah, Somerville, Wichita, Wilmington, Yonkers.

²² Baltimore 12, Boston 8, Chicago 8, Cleveland 12 (7 in bathhouses), New York (many), Norfolk 6, Portland 5, St. Louis 12, Seattle 5.

²³ Atlanta, Camden, Columbus, Dallas, El Paso, Indianapolis, Knoxville, Milwaukee, Toledo, Wilkes-Barre.

details, but 12 cities provided one or more shifts of both male and female attendants.²⁴

Comfort stations in public parks did not usually furnish hot water, soap, towels, or attendants, Denver, Fall River, and Newark being notable exceptions, in that they provided all these services. A few other cities supplied soap, towels, and attendants, but no hot water.

Half the cities charged no fee for any services at comfort stations. The others made a charge, usually 5 cents, for the use of special toilets or for soap and towel at down-town comfort stations. Boston charged 10 cents for the use of private toilets. St. Louis charged 1 cent for soap and 2 cents for towels. The excellent installations maintained in Allentown produced an income in 1923 of \$3,610, and that in Wilkes-Barre about \$2,000.

Operation of publicly owned comfort stations was generally under the department of parks or the department of public works, but in five cities it was entirely in the hands of the health department, and the cost of operation was included in the latter's budget.²⁵

In a majority of the cities the health department inspected the sanitary condition and in few the plumbing of comfort stations. Such inspections were made either periodically or frequently in only 10 cities,²⁶ only occasionally or on complaint in 15, and the others did not report the frequency.

PRIVATE SEWERAGE SYSTEMS

Extent of use.—Over one-third of the cities reported that private sewerage systems were in use in 1923. In 15 cities private sewers were owned and used exclusively by industrial plants,²⁷ in 5 cities exclusively by institutions,²⁸ in 10 by individual home owners or land-development corporations, and in 7 by more than one of these types of owners.²⁹

For the first two groups of 20 cities the number of industries or institutions using such private sewerage systems was reported, but not the number of persons. The last two groups of 17 cities include 11 in which less than 1 per cent of the population was served by such

²⁴ Bayonne, Harrisburg (2 shifts), Jacksonville, Lawrence (2 shifts), Lowell (3 shifts), Manchester, Newark, Springfield (3 shifts), Utica (2 shifts), Washington, Wilkes-Barre, Worcester.

²⁵ Allentown (\$5,872), Boston (\$42,307), Chicago (\$11,250 in 1922), St. Paul (\$6,011), Salt Lake City (\$3,463).

²⁶ Dallas, Houston, Jacksonville, Jersey City, Memphis, Reading, St. Joseph, Spokane, Springfield, Syracuse.

²⁷ Bridgeport (12 systems), Detroit (few), El Paso (1), Fall River (10), Flint (2), Fort Worth (2), Kansas City (Kans.), Lawrence, Los Angeles, Lowell, Lynn (1), Manchester (2), Portland (many), Youngstown (some), Indianapolis (few).

²⁸ Louisville (few), Oakland (1), St. Joseph (2), San Diego (1), Scranton (isolation hospital).

²⁹ Baltimore, Bayonne, Birmingham, Duluth, Jacksonville, Philadelphia, Richmond.

systems,³⁰ 5 cities in which over 1 per cent was served,³¹ and 1 (Norfolk) for which the percentage was not stated. Chicago reported a very few privately owned systems in use but no details of ownership were given. For five others no information on private sewers was available.

Treatment and disposal.—In most cities sewage from private systems received no treatment. In 9 cities it was passed through septic tanks.³² In Camden and Scranton it was treated, but the method of treatment was not reported. The sewage from two of Duluth's private systems was settled in Imhoff tanks and chlorinated, and that from the third passed through a sprinkling filter. In Los Angeles it was passed through fine screens.

Septic tank effluents from private sewers were usually disposed of by subsoil drainage. In all other cases the raw sewage or treated effluent was discharged into some body of water, with the exception of a few that emptied into the city sewers.

Supervision by health department.—Very few city health departments exercised close supervision over private sewerage systems, and among these were Baltimore, Salt Lake City, Scranton, and Washington. Usually inspection was made by the health department only on complaint or to abate nuisances. In many cities the health department paid no attention whatever to private sewerage systems, some claiming it was unnecessary.

PRIVIES, CESSPOOLS, ETC.

Types of privies in use.—Approximately 13.6 per cent of the population of the 100 cities surveyed were reported as not connected to either public or private sewerage systems in 1923. These included 6.2 per cent using privy vaults or pits, 4.1 per cent using cesspools, 2.5 per cent using surface, box, or can type privies, and 0.8 per cent using septic tanks. Cesspools and septic tanks differ from the other types in that they are often used in connection with indoor flush closets.

The great majority of cities reported using two or more different types of privies. Only one type of privy was used in 25 cities, two different types were used in 39, three different types in 20, and all four types in 6 cities.³³ For eight cities there was no information

³⁰ Baltimore, Bayonne, Birmingham, Cincinnati, Erie, New Haven, Paterson, Philadelphia, Salt Lake City, Washington, Yonkers.

³¹ Camden (1,600 houses of United States Shipping Board), Duluth (3 per cent of population), Jacksonville (10 per cent), Kansas City, Mo. (50 miles of sewer), Richmond (2.2 per cent).

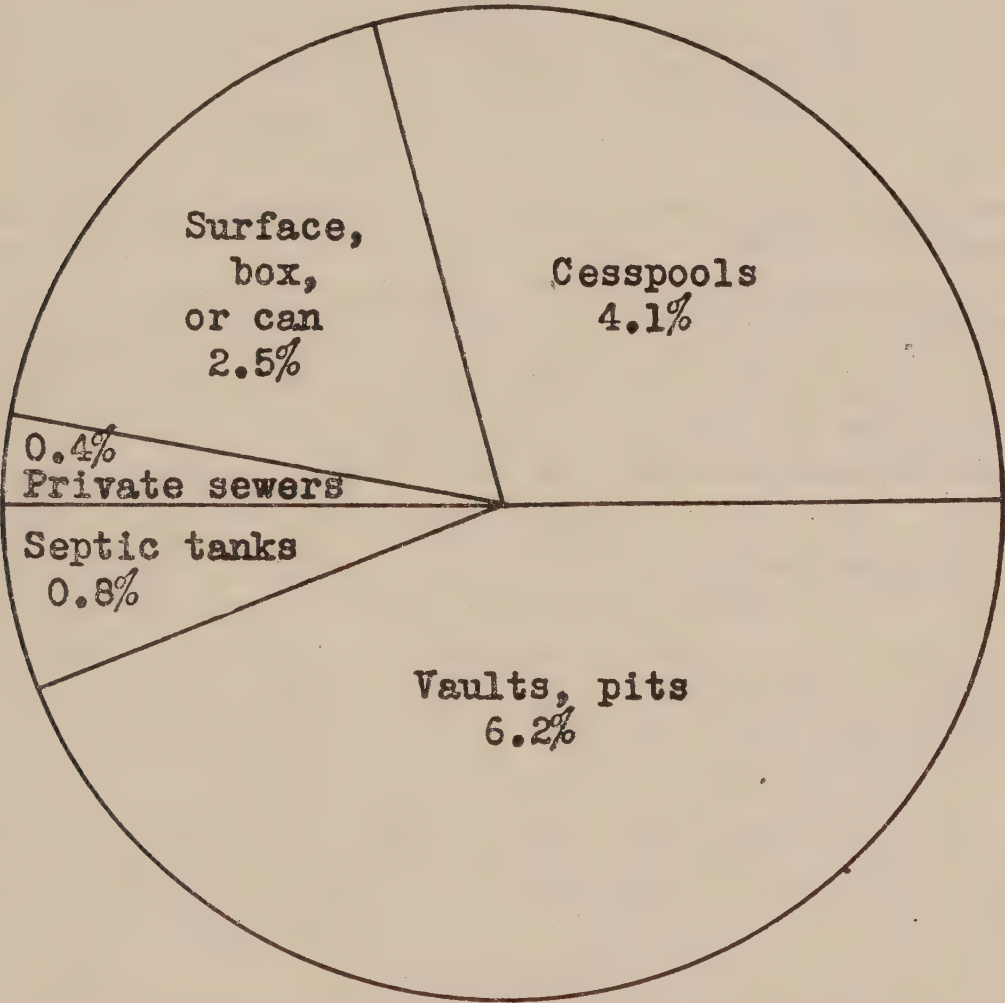
³² Baltimore, Birmingham, Cincinnati, Jacksonville, Louisville, Oakland, Salt Lake City, San Diego, Washington.

³³ Baltimore, Birmingham, Camden, Manchester, St. Paul, San Diego.

as to types in use. The predominant type or types of privies used in the various cities was reported as follows:

Predominant types of privies in use, 1923

Predominant types	Num-ber cities	Cities
Vaults-----	34	Akron, Buffalo, Chicago, Cleveland, Dayton, Des Moines, Detroit, Duluth, Elizabeth, Evansville, Fall River, Flint, Fort Wayne, Grand Rapids, Harrisburg, Indianapolis, Kansas City, Kans., Kansas City, Mo., Knoxville, Milwaukee, Minneapolis, Nashville, New Orleans, Oakland, Peoria, Portland, St. Joseph, St. Louis, San Antonio, Scranton, Seattle, Toledo, Yonkers, Youngstown.
Surface-----	17	Atlanta, Birmingham, Dallas, Denver, Fort Worth, Houston, Jacksonville, Jersey City, Memphis, Oklahoma City, Omaha, Paterson, Richmond, Salt Lake City, Savannah, Tulsa, Washington.
Vaults and cesspools..	13	Allentown, Cincinnati, Newark, New Bedford, Providence, Reading, St. Paul, San Francisco, Spokane, Springfield, Utica, Wichita, Wilmington.
Cesspools-----	12	Cambridge, Canton, Columbus, Hartford, Lawrence, Lowell, New Haven, New York, Pittsburgh, Somerville, Trenton, Waterbury.
Surface, vaults, and cesspools	8	Baltimore, Bridgeport, Camden, El Paso, Erie, Louisville, Manchester, Worcester.
Septic tanks-----	3	Norfolk, Philadelphia, San Diego.
Surface and cesspools..	3	Los Angeles, South Bend, Tacoma.



EXCRETA DISPOSAL METHODS EMPLOYED BY THE 4,500,000 PERSONS (14 PER CENT OF TOTAL) NOT CONNECTED WITH THE PUBLIC SEWERS IN 1923.

FIG. 16

Extent used.—In practically every city privies or cesspools were used in sparsely built-up outskirts, sometimes even in thickly settled sections, where sewers were lacking or inadequate. Bayonne claimed to have no privies, and Somerville only two cesspools. Yonkers did not state the percentage of the population using privies. For the other cities the percentages were reported as follows:

Per cent of population using privies, cesspools, etc., 1923

Per cent using	Number cities	Cities
Under 1..	9	Buffalo, Cambridge, Elizabeth, Hartford, Jersey City, Milwaukee, Newark, Syracuse, Wilkes-Barre.
1 to 4.....	22	Albany, Chicago, Cleveland, Columbus, Dayton, Denver, Detroit, Evansville, Harrisburg, Lawrence, Manchester, New Bedford, Oakland, Pittsburgh, Providence, Rochester, San Francisco, Schenectady, Seattle, Toledo, Tulsa, Washington.
5 to 9.....	20	Atlanta, Dallas, Duluth, El Paso, Erie, Fort Wayne, Grand Rapids, Lowell, Memphis, Minneapolis, New Orleans, Norfolk, Paterson, Richmond, St. Louis, Salt Lake City, Springfield, Troy, Utica, Worcester.
10 to 19....	22	Akron, Birmingham, Boston, Bridgeport, Canton, Fort Worth, Kansas City (Mo.), Los Angeles, New Haven, New York, Oklahoma City, Omaha, Peoria, Philadelphia, St. Joseph, St. Paul (estimated), San Diego, Savannah, Sioux City (estimated), Trenton, Wilmington, Youngstown.
20 to 29....	12	Baltimore, Camden, Des Moines, Flint, Houston, Indianapolis, Kansas City (Kans.), Nashville, Scranton, South Bend, Waterbury, Wichita.
30 to 39....	8	Cincinnati (estimated), Jacksonville, Louisville (estimated), Lynn (estimated), Portland, Reading, San Antonio, Spokane.
Over 40...	4	Allentown (70), Fall River (estimated 50), Knoxville (50), Tacoma (40).

Considerable disagreement exists between the percentage reported connected to sewers and that using privies in 10 cities, hence for these cities the figures can not be considered reliable.³⁴

Efforts to abolish.—Only 2 cities (Atlanta, Jacksonville) reported that practically no efforts were made to abolish privies, the latter because of inadequate ordinances. Most cities claimed that connections were enforced with more or less vigor as sewers became available. As previously noted, however, there were 9 cities where so large a proportion (10 per cent or more) of the residents was reported not connected on streets where sewers were available as to warrant further attempts to enforce connections. Two of these (Evansville, Indianapolis) were making good progress since new ordinances had been enacted; Birmingham was issuing no further privy permits; in Reading enforcement of connections was lagging due to lack of sewage disposal facilities. Chicago and Cincinnati reported that privies were abolished when they became a nuisance.

Supervision by health department.—The health department in all but four cities was in complete charge of privy sanitation. It usually inspected conditions and corrected nuisances. A few health departments, as in Allentown, issued permits for installation of privies. Five reported making inspections to insure proper type and tightness of cans or boxes.³⁵

³⁴ Atlanta, Boston, Bridgeport, Denver, Evansville, Oakland, Peoria, St. Joseph, Tulsa, Wichita.

³⁵ Birmingham, Dallas, Lawrence, Pittsburgh, Washington.

For 17 cities the frequency of privy inspection was not reported. About one-third of the health departments inspected only as needed or on complaint or at irregular intervals, and nearly one-half made frequent or at least periodic inspections. For the latter group the frequency of inspection was reported as follows: Weekly in Savannah; biweekly in Salt Lake City; monthly in Bridgeport, Duluth, Portland, Richmond, San Francisco; bimonthly in Birmingham, El Paso; two to five times a year in 12 cities;³⁶ annually in 8;³⁷ and for the remainder the time interval was not specified.³⁸

In Atlanta and Denver supervision of privies was under the department of sanitation, in Fort Worth under the scavenger department, and in San Antonio under the department of parks and sanitation.

Records of privy inspections were kept by many health departments, but these were often inadequate, and in some cases they were not separated from other sanitary inspection records.

Fecal exposure.—Of 34 cities in which vaults were the predominant type of privies, the extent of fecal exposure was reported as nil in 4, slight or limited in 25, and considerable or extensive in 5 cities or 15 per cent of this group. The corresponding figures for 16 cities in which cesspools were the predominant type were 6, 10, and 0. For 15 cities in which surface types were predominant the figures were, respectively, 3, 5, and 7, the last being 47 per cent of this group.

From the standpoint of accessibility to flies the extent of fecal exposure is of importance, particularly in Southern cities. Many cities did not enforce screening of privies, while in others screens were often inadequate or defective. The figures given above are of interest because they indicate that, as regards the extent of fecal exposure in the three most commonly used types of privies, cesspools were the least frequent offenders and surface privies the most frequent.

Seventeen cities claimed to have no fecal exposure in privies,³⁹ and 14 reported it as extensive.⁴⁰ In the others it was either slight or not reported.

³⁶ Columbus, Elizabeth, Hartford, Houston, Memphis, Minneapolis, Nashville, Oakland, Reading, St. Joseph, Toledo, Trenton.

³⁷ Cincinnati, Dayton, Detroit, Grand Rapids, Milwaukee, Newark, Spokane (also on complaint), Youngstown.

³⁸ Chicago (during systematic canvass), Des Moines, Harrisburg (many in summer), Indianapolis, Jersey City, Kansas City (Mo.), Knoxville, New Haven (frequent), Norfolk, Omaha, Pittsburgh, Scranton, Washington, Wichita, Wilmington (frequent).

³⁹ Cambridge, Columbus, Duluth, El Paso, Fall River, Jersey City, Lawrence, Lowell, Lynn, Manchester, New Bedford, Norfolk, Omaha, St. Joseph, St. Paul, Somerville, Washington.

⁴⁰ Akron, Atlanta, Birmingham, Camden, Fort Worth, Indianapolis, Houston, Jacksonville, Knoxville, Louisville, Memphis, Nashville, Savannah, Toledo.

Soil pollution.—As in the case of fecal exposure, cesspools were responsible for less soil pollution than other types, and surface privies were reported as the most frequent offenders. Of 36 cities in which vaults were the predominant type, the extent of soil pollution was reported as nil in 4, slight in 23, and considerable in 9 cities, or 25 per cent of this group. For 14 cities in which cesspools were the predominant type, the figures were, respectively, 5, 8, and 1, the last being 7 per cent of this group. For 15 cities in which surface types were predominant the corresponding figures were 3, 6, and 6, the last amounting to 40 per cent of this group.

Soil pollution is of importance where well supplies are used. It is almost inevitable in low places where overflows and floods occur, and the danger in limestone country is well known.

Altogether, 13 cities claimed an absence of soil pollution⁴¹ and 18 reported it as extensive.⁴² The others either did not state the extent or reported it as slight.

NIGHT SOIL

Facilities for collection.—Scavenger service was reported in all but 17 cities, in which either the number of privies was so small that cleaning was left to the initiative of the individual householder, or the privies were of a type that requires little or no cleaning. Private scavenging service was the rule, but in 3 cities it was conducted by the health department,⁴³ and in 9 by some other municipal agency.⁴⁴ Six cities let contracts for scavenging.⁴⁵ For Albany, Schenectady, and Troy there was no information on night soil.

Where organized scavenger service was necessary, legal provisions were made through statute, ordinance, or health department regulation in all cities except four.

Tight, covered receptacles, whether cans, barrels, or tank wagons, were probably required for collecting in most places, although only 15 cities actually reported such requirement. Columbus and Duluth allowed scavenging only at night.

⁴¹ Allentown, Jersey City, Kansas City (Kans.), Lawrence, Lowell, Lynn, New Bedford, Omaha, Pittsburgh, St. Joseph, Scranton, Somerville, Washington.

⁴² Akron, Birmingham, Camden, Canton, Duluth, El Paso, Fall River, Fort Worth, Houston, Indianapolis, Jacksonville, Knoxville, Minneapolis, Nashville, Paterson, St. Paul, Savannah, Toledo.

⁴³ Cleveland (special fund), Houston, Jacksonville.

⁴⁴ Atlanta, Birmingham, Dallas, El Paso, Grand Rapids, Lynn, Memphis, Savannah, Spokane.

⁴⁵ Fort Wayne, Fort Worth (also private scavengers), Nashville, New Bedford, Richmond, Washington.

The number of scavengers ranged from only 1 in many cities to as high as 20 in Omaha, depending on the number of privies and the frequency of cleaning.

Scavenger licenses.—Where the municipality did its own scavenging, or where it let out contracts, licenses were, of course, unnecessary. Most other cities, where organized private scavenging obtained, required that all scavengers be licensed for purposes of readier control. Columbus, Dayton, and St. Joseph, however, required no license, but the health department issued permits for each cleaning. (Such permits were likewise issued by a number of health departments in addition to the license requirement.)⁴⁶ In 8 cities scavengers operated without license or permit.⁴⁷ New Haven's requirements for license were so expensive that work was being done by unlicensed scavengers.

In most of the 50 cities requiring licenses, these were issued by the health department, but in 12⁴⁸ by some other department or official.

A fee ranging from \$1 to \$250 was charged by all cities requiring licenses except 9. Baltimore had no license fee, but required bonding of scavengers and charged 25 cents for each permit to haul one load of 6 barrels, this revenue paying for laborers at the dumping stations.

Licenses were usually issued for a term of one year. In Camden and Waterbury the term was indefinite; in Kansas City, Mo., 10 years; Los Angeles, three months; Sioux City, two years; and Wichita, five years.

Frequency of collection.—Cleaning of privies in most cities was not periodic, but only when the owner or the inspector deemed it necessary, or when the contents were at or within a specified distance (ranging from 8 inches to 3 feet) from the top. In Oakland no scavenging was done, the old pits being abandoned and covered with lime and earth. In Omaha the privies were cleaned when half full.

Cities using surface, can, or box privies, particularly those in the South, were usually compelled to scavenge periodically and at short intervals. Atlanta, Birmingham, Fort Worth, and Memphis collected weekly; Jacksonville semimonthly; Dallas every three weeks; Oklahoma City, Richmond, and Tulsa about monthly. In some cases the frequency was increased in summer. There were 6

⁴⁶ Allentown, Baltimore, Cincinnati, Harrisburg, Pittsburgh, Reading, St. Louis.

⁴⁷ Bridgeport, Canton, Elizabeth, Knoxville, Louisville, Peoria, Tacoma, Wilmington.

⁴⁸ Baltimore, Cincinnati, Denver, Evansville, Los Angeles, Minneapolis, New Orleans, Providence, San Antonio, Sioux City, South Bend, Springfield.

cities, using vaults for the most part, which reported annual cleaning, or oftener if necessary.⁴⁹

Disposal of night soil.—In most cities night soil either was hauled outside the city where it was buried or ploughed under on farms as fertilizer, or it was discharged into trunk sewers at special dumping stations with washing facilities, or at selected manholes, or even at the sewage disposal plant. Thirty-two cities reported using the first method, and 28⁵⁰ the second. In 10 cities night soil was dumped or flushed directly into the river.⁵¹ Boston dumped night soil at sea, Cleveland burned it at the garbage reduction plant, Elizabeth and Newark, respectively, dumped and buried it on salt meadows, Lynn dumped it at the harbor front and covered it with ashes, Portland required disposal on the premises of each householder, South Bend dumped it in an abandoned mine and covered it with gravel, and Tacoma used the garbage dump for this purpose.

Nuisances created by the collection and disposal of night soil were reported entirely or practically absent in most cities. In 16 cities nuisances were few or occasional, and 6 others⁵² reported the existence of nuisances but not the extent. Birmingham reported that cans were spilled and dripped on the streets. In Dallas nuisances existed at privies during cleaning. Indianapolis reported odors in summer as far distant as 5 to 10 miles from the farm dump. Reading complained of overflowed cesspools, and Youngstown reported bad conditions when the river was low.

Supervision by health department.—The degree of control exercised by the health department over the collection and disposal of night soil depended of necessity on the number and type of privies as well as on the method of scavenging. In general the goal of the health department seems to have been the prevention and abatement of nuisance.

As previously noted, three health departments actually performed the scavenging; and in all but 12 of the 50 cities requiring scavenger licenses these were issued by the health department. In 13 cities the health department had no supervision over scavenging, this work being entirely controlled by some other department⁵³ or, as in Hart-

⁴⁹ Dayton, Grand Rapids, Indianapolis, Milwaukee, St. Paul, Spokane.

⁵⁰ Atlanta, Baltimore, Birmingham, Chicago, Cincinnati, Columbus, Dallas, Dayton, Denver, Des Moines, El Paso, Fort Worth, Houston, Jacksonville, Knoxville, Los Angeles, Memphis, Minneapolis, New Orleans, New York (disinfected), Omaha, Pittsburgh, Richmond, Salt Lake City, San Antonio, Springfield, Washington, Youngstown.

⁵¹ Fort Wayne, Jersey City (hypochlorite used), Kansas City (Kans.), Nashville, Norfolk, St. Joseph, St. Louis, St. Paul, Sioux City, Spokane.

⁵² Duluth, Elizabeth, Houston, Lynn, Pittsburgh, Wilmington.

⁵³ Atlanta, Dallas, Denver, El Paso, Fort Worth, Lynn, Memphis, Minneapolis, San Antonio, South Bend.

ford, Peoria, and Portland, by no municipal agency. Columbus reported that the health department merely issued permits for cleaning, while in Reading and St. Louis it licensed scavengers and issued permits. In Providence the police department was charged with supervision of scavenging, the health department taking action only when necessary. Ten health departments made inspections only on complaint.⁵⁴ In the remaining 50 cities reporting on this item the health department claimed to have complete supervision, except that in Nashville and Worcester it controlled the collection, but not the disposal of night soil. Five of these also reported issuing permits for cleaning privies. However, only 8 of those claiming to exercise complete supervision definitely reported making routine inspections.⁵⁵

Quite a number of cities kept no records of scavenging or inspections. Some had only a record of permits issued for cleaning, while in a few the scavenger's record of the number of loads hauled was all that was available.

PROGRESS IN SEWAGE AND EXCRETA DISPOSAL PRACTICE SINCE 1920 SURVEY

A comparison of the information collected during the present survey, as of 1923, with that contained in the report on the 1920 survey (Public Health Bulletin No. 136) shows that a number of changes in sewage and excreta disposal practice had taken place. Since the comparisons are necessarily confined to items common to both reports, and even for these only to cities for which comparable data were obtained in both surveys,⁵⁶ many changes that had actually occurred are undoubtedly not included in the following list. Possibly certain changes are recorded where no actual changes had occurred, simply because information was not obtained from the same sources in both surveys. It is obvious that the following comparisons can not be altogether complete and correct.

Population served by public sewers.—According to the 1920 report approximately 84 per cent of the population of the 71 cities reporting on this item was, in that year, "served" by the public sewers. In 1923 about 86 per cent of the population of the 99 reporting

⁵⁴ Akron, Birmingham, Dayton (also issued cleaning permits), Fort Wayne, Knoxville, Los Angeles, Louisville, New Orleans, Omaha, Tacoma.

⁵⁵ Allentown, Boston, Chicago, Elizabeth, Indianapolis, Kansas City (Mo.), Tulsa, Youngstown.

⁵⁶ The following 17 cities were surveyed in 1924 but not in 1920: Allentown, Bayonne, El Paso, Evansville, Fort Wayne, Harrisburg, Knoxville, Manchester, Peoria, St. Joseph, Sioux City, South Bend, Troy, Tulsa, Waterbury, Wichita, Wilkes-Barre.

cities was actually connected to the public sewers, while the population accessible to the public sewers was at least 5 per cent greater. If "served" means "accessible to," as it was probably interpreted to mean by those supplying the figures, the population accessible to public sewers in 1923 was at least 7 per cent greater than in 1920. As regards the percentage actually connected, there are no comparable data.

The proportion of the population accessible to public sewers appears to have changed considerably (i. e., 10 per cent or more) in 21 cities since 1920; it rose in 14 cities and fell in 7. The increase amounted to 45 per cent of the population in Reading, 35 per cent in Houston, between 20 and 30 per cent in Des Moines, Indianapolis, and Kansas City, Kans., and between 10 and 20 per cent in 9 cities.⁵⁷ A decrease of 25 per cent seems to have occurred in Lynn, and of between 10 and 20 per cent in 6 cities.⁵⁸ Where an actual decrease occurred it was probably due to growth in population, as by annexations, without a corresponding increase in public sewerage facilities.

Sewage disposal.—In 1923 Cleveland treated two-thirds of its sewage by plants installed in 1922. Los Angeles, which in 1920 treated the sewage of the harbor district only, in 1923 provided fine screens for the sewage from the entire city. Bridgeport had Reinsch-Wurl screens for 90 per cent of its sewage, reported to have been installed in 1919, but not mentioned in the 1920 report. El Paso, which was not surveyed in 1920, began to settle its entire sewage in 1923.

Akron's plant in 1923 could treat only one-third of the city sewage instead of one-half as in 1920. Camden had, since 1920, abandoned the settling of part of its sewage, but hoped to install a new plant within 10 years.

Population using privies.—The 1920 report shows that 7.7 per cent of the population of the 73 cities reporting were using privies. This figure is probably exclusive of those using cesspools. In 1923, 9.5 per cent used privies (and an additional 4.1 per cent used cesspools). This increase of 1.8 per cent was only an apparent increase, since 8 cities each having over 20 per cent (averaging 38 per cent) of the population using privies were included in the 1923 average but not in the 1920 average. If these be considered, the apparent increase between 1920 and 1923 of 1.8 per cent in the proportion of the population using privies becomes in reality a decrease of approximately 1 per cent.

⁵⁷ Birmingham, Cleveland, Duluth, Omaha, St. Louis, Salt Lake City, San Antonio, Seattle, Spokane.

⁵⁸ Atlanta, Cincinnati, Denver, Flint, Scranton, Tacoma.

The proportion of the population using privies (cesspools not included) appears to have changed considerably (i. e., 10 per cent or more) in 9 cities since 1920; downward in 6 cities and upward in 3. The decrease amounted to between 20 and 30 per cent in Duluth and Houston, and between 10 and 20 per cent in Fort Worth, Kansas City, Kans., Omaha, and St. Paul. An increase of 10 to 20 per cent seems to have occurred in Cincinnati, Flint, and Scranton.

Supervision of privies by health department.—In 6 cities the health department had assumed greater control over privy sanitation since 1920. Duluth, Kansas City, Mo., Omaha, and Scranton had changed from irregular to periodic inspections of privies, these being now made monthly in Duluth. Savannah had increased the frequency of inspections from monthly to weekly, and Birmingham from quarterly to bimonthly.

TABLE II.—*Summary of changes in sewage and excreta disposal practice since the 1920 survey*

Item	Number of cities	
	Improved	Retrogressed
Per cent population accessible to public sewers.....	14	7
Sewage disposal facilities.....	4	2
Per cent population using privies.....	6	3
Supervision of privies by health department.....	6	0

SUMMARY

Public sewers were everywhere publicly owned and operated in 1923. While combined sewers were still the predominant type, there has of late been a decided tendency toward separate sewers.

Only 86 per cent of the total population was actually served by public sewers, although an additional 5 per cent was accessible to them. In nine cities so large a proportion of the population was reported not connected on streets where sewers were available as to warrant strenuous efforts to enforce connections.

A large number of outside flush closets was still in use in 16 cities. Fecal exposure was admitted to be a problem in six cities.

The sewage from 11.5 per cent of the total population was given preliminary treatment only, and that from 6 per cent was treated biochemically. While over 82 per cent was, therefore, still being discharged without any treatment, resulting in the creation of decided nuisances in 16 cities, many cities were installing or planning new treatment plants or additions to existing ones.

TABLE III.—Some important details of sewage and excreta disposal practice in 100 cities, 1923

City	Public sewerage system					Private sewerage systems		Privies, cesspools, etc.					Night soil					
	Date installed or started	Separate or combined	Per cent population connected	Per cent of sewage treated	Number outside flush closets	Number down-town public comfort stations	Number industries or institutions using	Per cent population using domestically	Predominant types in use	Per cent population using	Number inspections per year by health department	Extent of fecal exposure	Extent of soil pollution	By whom collected	Number collections per year	Disposal	Nuisances	Supervision by health department
Akron	1880	Both	90	33	S	2	0	0	v	10	S	L	L	Pl	R	b	S	IC
Albany	x	Combined	98	100	x	x	x	x	x	2e	I	S	x	Plp	R	x	x	pIDF
Allentown	1921	Both	24	15	S	2	0	0	vc	70	dI	S	N	Plp	52	m	N	N
Atlanta	1889	Both	80	80	y	1	2	x	sve	6	C	S	S	Plp	R	m	N	pF
Baltimore	1906	Separate	75.5	100	0	12	2	S	N	24e	N	N	N	N	0	N	N	N
Bayonne	1878	Combined	100	0	LT	1	10	0.25	s	0	6	L	x	d	52	m	LT	C
Birmingham	1900	Separate	80a	100	0	0	4	0.4	x	10e	x	S	S	Pl	R	T	N	IDF
Boston	1884	Both	90	100	0	8	0	0	sve	10	12	L	x	Pl	R	x	N	F
Bridgeport	1908	Both	80	90	x	0	12	0	v	0.2	x	S	S	Pl	R	f	N	F
Buffalo	1840a	Both	99.8	0	5,000	1	0	0	c	0.7	x	S	S	Pl	R	f	N	F
Cambridge	1845	Both	99.3	0	0	2	0	0	sve	25	C	L	x	Pl	0	N	N	N
Camden	1850a	Combined	75	0	y	1	0	0	c	15	I	S	L	Pl	I	f	N	F
Canton	1883	Separate	85	100	S	8	S	S	v	1.5e	I	S	x	Pl	R	m	N	ID
Chicago	1856	Combined	95-98	S	x	3	0	0.03	vc	32e	yT	S	x	Plp	R	m	N	pF
Cincinnati	1857	Both	68	S	LT	12	0	0	v	2e	C	S	x	Plp	R	T	N	FT
Cleveland	1859a	Combined	98e	67	y	2	0	0	v	2.5	2	x	S	Plp	R	m	N	p
Columbus	1905	Both	93	100	y	2	0	0	c	7.3	x	S	S	Plp	R	m	N	N
Dallas	1914	Separate	99	100	y	1	0	0	s	1	1-2	S	x	Plp	17	m	LT	N
Dayton	1876	Separate	99	0	y	3	0	0	v	3	dI	S	S	Pl	R	m	S	pC
Denver	1885	Separate	65	0	y	4	0	0	v	25	Q	S	S	Pl	R	m	N	F
Des Moines	1880	Both	75	S	x	3	0	0	v	2	1	S	S	N	0	N	N	N
Detroit	1846	Both	95-98	0	1,000	3	S	3.4	v	5	12	L	S	Pl	R	f	N	F
Duluth	1885	Both	95	0	0	y	0	0	v	0.3	2-4	S	S	Pl	R	T	N	D
Elizabeth	1898a	Combined	99.7	0	L	1	1	0	v	5	6	L	S	P	R	m	N	N
El Paso	x	Separate	95	100	L	1	1	0	sve	5	C	S	S	d	0	N	N	N
Erie	x	Both	89a	0	S	0	0	0.5	v	10e	x	L	S	N	0	N	x	F
Evansville	1857	Both	60a	0	35-40	0	0	0	v	2	C	S	S	Pl	R	f	N	F
Fall River	1873	Both	50e	0	0	1	10	0	v	50e	C	S	x	Pl	R	f	N	F
Flint	1890	Separate	70	0	20-25	1	0	0	v	25a	C	S	N	Pl	R	f	N	F
Fort Wayne	1844	Combined	95	0	L	3	0	0	v	7	R	S	x	Pl	R	r	N	C
Fort Worth	1880a	Separate	80-85	0	y	0	2	0	s	12.6	d	L	S	KP	52	m	N	F
Grand Rapids	1855a	Combined	90	0	0	1	x	x	v	6e	1	S	S	KP	1	f	N	F

City	Year	Population	Area	Water	Waste	Disposal	Notes
Harrisburg	1800a	99	Both	0	0	0	
Hartford	1830	99a	Combined	0	0	0	
Houston	1900	87	Both	100	0	0	
Indianapolis	x	70a	Both	0	0	0	
Jacksonville	1879	64	Both	300	0	0	
Jersey City	1870	99	Combined	0	0	0	
Kansas City, Kans.	1886	74a	Both	0	0	0	
Kansas City, Mo.	1856	65	Both	0	0	0	
Knoxville	1897	50	Separate	2	0	0	
Lawrence	1853	98	Both	0	0	0	
Los Angeles	1890	87	Separate	100	0	0	
Louisville	1854	66	Both	0	0	0	
Lowell	1836a	90	Both	0	0	0	
Lynn	1870	65	Both	15-20	0	0	
Manchester	1880	98	Combined	0	0	0	
Memphis	1880	95	Separate	0	0	0	
Milwaukee	1869	99.6	Combined	0	0	0	
Minneapolis	1870	95	Combined	0	0	0	
Nashville	1870	75	Combined	0	0	0	
Newark	1854	99a	Both	0	0	0	
New Bedford	1850	80.5	Both	0	0	0	
New Haven	1871	92	Separate	0	0	0	
New Orleans	1906	89e	Both	0	0	0	
New York	1840	95	Separate	0	0	0	
Norfolk	1874	95	Both	0	0	0	
Oakland	1856	85	Both	0	0	0	
Oklahoma City	1890a	85	Separate	0	0	0	
Omaha	1888	90	Separate	0	0	0	
Paterson	1850	95	Combined	0	0	0	
Peoria	x	75a	Both	0	0	0	
Philadelphia	1824	90a	Both	0	0	0	
Pittsburgh	1868	96a	Both	0	0	0	
Portland	1874	60	Combined	0	0	0	
Providence	1872	96	Both	100	0	0	
Reading	1896	65-70	Separate	80	0	0	
Richmond	x	95	Both	88	0	0	
Rochester	1824a	95	Both	0	0	0	
St. Joseph	1880a	75	Both	0	0	0	
St. Louis	x	90	Combined	0	0	0	
St. Paul	1869	85	Combined	0	0	0	
Salt Lake City	1890	95	Separate	0	0	0	
San Antonio	1894	65	Separate	0	0	0	
San Diego	1880	90	Combined	0	0	0	
San Francisco	1851	98	Combined	0	0	0	

C—Inspection on complaint.
D—Periodic inspection.
F—Complete or full.
I—Irregular or occasional.
K—Contractor for city.
L—Large, much, or extensive.
N—No or none.
P—Private scavengers.

Q—Frequent inspection.
R—As required.
S—Slight, small, or few.
T—See text for details.
a—Approximate.
b—Buried outside of city.
c—Cesspools.

p—Permit issued for cleaning.
r—Dumped or flushed into river.
s—Surface, can, or box.
t—Septic tank.
v—Vaults or pits.
x—No data.
y—Some, but no estimate given.

TABLE III.—Some important details of sewage and excreta disposal practice in 100 cities, 1923—Continued

City	Public sewerage system					Private sewerage systems		Privies, cesspools, etc.					Night soil					
	Date installed or started	Separate or combined	Per cent population connected	Per cent of sewage treated	Number outside flush closets	Number down town public comfort stations	Number industries or institutions using	Per cent population using domestically	Pre-dominant types in use	Per cent population using	Number inspections per year by health department	Extent of fecal exposure	Extent of soil pollution	By whom collected	Number collections per year	Disposal	Nuisances	Supervision by health department
Savannah	1898	Both	85	0	14,000	0	0	0	S	15	52	L	L	d	R	f	N	F
Schenectady	x	Separate	95-98e	100	x	3	0	0	x	2-5e	x	x	x	Pl	x	x	x	N
Scranton	1872	Both	79a	0	200	3	1	0	v	20	D	x	N	N	0	N	N	N
Seattle	1898	Combined	96	0	S	5	0	0	v	4	R	S	S	Pl	R	r	S	N
Sioux City	1875	Both	85	0	0	1	0	0	x	15e	I	S	S	Pl	0	T	S	N
Somerville	1840	Both	100a	0	0	0	0	0	c	0a	R	N	S	Pl	R	r	S	N
South Bend	1872	Combined	70	0	y	1	0	0	sc	30e	y	S	S	d	1	r	S	N
Spokane	1886	Combined	65	0	400	2	0	0	vc	38.5	I	S	S	Pl	R	m	N	N
Springfield	1873	Both	90	0	0	1	0	0	vc	5-10e	R	S	S	N	0	T	N	N
Syracuse	1885	Both	99	0	S	2	0	0	x	1a	C	S	S	P	R	b	N	C
Tacoma	1883	Both	60a	0	y	y	0	0	sc	40	C	S	S	Pl	R	f	N	I
Toledo	x	Combined	96	0	y	y	0	0	v	4e	3	L	S	Pl	R	b	N	F
Trenton	1888	Both	90a	0	2,500	4	0	0	c	10	x	S	S	Pl	x	x	N	C
Troy	1830	Both	90	0	100a	x	x	x	x	10e	3	S	S	Pl	x	b	N	I
Tulsa	1908a	Separate	69a	0	0	0	0	0	S	4	I	S	S	Pl	12	m	N	N
Utica	1840a	Both	95a	0	0	1	0	0	vc	5a	C	S	S	K	0	b	N	F
Washington	1871	Both	97.2	100	x	4	0	0.1	S	2.8	Q	N	S	Pl	R	m	N	I
Waterbury	1883	Separate	75	0	0	1	0	0	c	25e	Q	S	S	Pl	R	b	N	F
Wichita	1885a	Both	65	0	S	0	0	0	vc	24	Q	S	S	Pl	R	f	N	N
Wilkes-Barre	1882	Combined	99.8	0	S	1	0	0	vc	0.2e	N	S	S	P	0	N	N	F
Wilmington	x	Combined	90	0	L	1	0	0	vc	15	Q	S	S	Pl	x	x	N	I
Worcester	1890	Both	95	100	0	1	0	0	svc	5e	x	S	S	Pl	R	b	N	N
Yonkers	1873a	Both	x	0	x	0	0	0	v	x	x	x	S	Pl	x	x	N	L
Youngstown	1872a	Combined	85-90	0	S	0	S	0	v	10-15	1	S	S	Pl	R	m	L	I

C—Inspection on complaint.
D—Periodic inspection.
F—Complete or full.
I—Irrregular or occasional.
K—Contractor for city.
L—Large, much, or extensive.
N—No or none.
P—Private scavengers.

Q—Frequent inspection.
R—As required.
S—Slight, small, or few.
T—See text for details.
a—Approximate.
b—Buried outside of city.
c—Cesspools.

d—City agency other than health department.
e—Estimated.
f—Hauled to farms as fertilizer.
h—By health department.
l—Scavengers licensed.
m—Into sewer at manhole, dump station, etc.

P—Permit issued for cleaning.
r—Dumped or flushed into river.
s—Surface, can, or box.
t—Septic tank.
v—Vaults or pits.
x—No data.
y—Some, but no estimate given.

In 20 cities there were no publicly owned comfort stations in the built-up sections, and most of the other cities maintained only one such station.

Fourteen per cent of the total population was not served by public sewers, 6.2 per cent used privy vaults, 4.1 per cent used cesspools, 2.5 per cent used surface types of privies, 0.8 per cent used septic tanks, and 0.4 per cent used private sewers. There were still 25 cities in which over 20 per cent of the population used privies or cesspools. Extensive fecal exposure was reported in 14 cities, and considerable soil pollution in 18. In both respects surface privies were the most frequent offenders.

Scavenging of privies was generally under close control, yet 5 cities complained of extreme nuisances.

Health department supervision of excreta disposal included enforcement of house connections in three-fourths of the cities; inspection of outside flush closets in most cities; actual operation of public-comfort stations in 5 cities, and sanitary inspection of stations in a majority of places; close supervision over private sewerage systems in only a very few cities; complete charge of privy sanitation practically everywhere; actual operation of scavenger system in 3 cities and more or less complete supervision over scavenging in all but 13 of the others.

Since the 1920 survey considerable progress had been made in sewage and excreta disposal facilities in a number of cities, though a few had retrogressed.

XVIII. GENERAL SANITATION

HENRY F. VAUGHAN, D. P. H., *Commissioner of Health, Detroit, Mich.*

When the first health departments were established in the United States during the middle of the past century it was generally believed that there were conditions in man's environment which were of paramount importance in determining his ability to ward off and prevent epidemics. It was during this period that New York was infested with typhus fever, cholera, typhoid fever, and not infrequently yellow fever and plague found their way into various seaports. These infestations were generally more prevalent in the congested areas of the large cities where people were herded together in close contact, and where the sanitary provisions were of the poorest. While we now appreciate that the spread of most of these epidemic conditions depended more upon the close personal contact between these vast hordes of immigrants who occupied the slums of our metropolitan areas, it was not surprising that the sanitarian of that day ascribed the lack of sanitation as the most important contributing factor. It developed, therefore, that a bureau of sanitary inspection was one of the first functions of the health department, and so to-day we still find the existence of such a bureau or division in most cities, and in those cases where sanitation is not a function of the health department an independent department of sanitation has been instituted.

In many instances the sanitary bureau of a health department has made little progress since the prebacteriology days, and has taken no advantage of the advances in science, which have shown conclusively that the individual himself is a far more potent factor in the spread of disease than is his environment. While this factor can not be overlooked there should not be that tendency to emphasize control measures which are relatively unproductive in the restriction of disease. It was first believed that sewer gas might be a cause of typhoid fever, or that diphtheria might result from the fermentation and decay of organic material. Pasteur and Koch had not yet made their brilliant contributions to the science of bacteriology, and sanitarians, feeling their way through the dark, falsely concluded that the effluvia and gases emanating from putrid sources might in themselves produce illness. It was not surprising that plumbing inspection early became a function of a health department. Many health departments are gradually relieving themselves of this burden and transferring the inspectorial service to a building depart-

ment, where it more logically belongs, since at best plumbing inspection is but a service to the trade and an assurance to the owner that he is not being cheated.

In many communities the citizen still views the health department as an organization consisting primarily of inspectors whose duty it is to see that the streets, alleys, and private premises are kept clean, and to see that the garbage receptacles are adequate, that they are sanitary and fly tight and, likewise, not infrequently appear upon the scene to place a conspicuous placard upon the premises informing the public that a case of infectious disease is isolated within the home. While the health department must assume the prime responsibility for the supervision of such functions as above mentioned, it should likewise assure the public of a safe water supply, of a sanitary means of sewage disposal, of an adequate garbage collection system, and efficient street cleaning. It seems reasonable that the more purely law-enforcement functions might better be transferred to that division of the city government whose prime function it is to enforce all laws.

The success of a health department lies largely in its educational program. As a case of last resort it will be necessary to have recourse to the strong arm of the law, to court action, and to more severe methods of treatment, but in the main the health department, like the department of education, will secure more lasting results through the sure but slow process of educating the individual. It seems to some of us, therefore, that there should be a gradual movement to place nuisance inspection and the quarantining of premises for contagious diseases in the hands of the police department. The health department can still maintain control over the entire situation by the detailing of a suitable number of officers to the health department, such men to be in uniform, to have all the powers which attain to the ordinary patrolman, and to be carried on the pay roll of the police department. In this way we may gradually change public sentiment and viewpoint so that the matter of inadequate garbage receptacles, the uncovered manure box, and the neighborhood nuisance, may ultimately be regarded in their true light as matters of law enforcement.

We would not abandon the sanitary bureau, rather we would strengthen it and build it along scientific lines. The relationship to disease dissemination of inadequate housing, overcrowding, lack of sunlight, the use of damp unventilated rooms for sleeping purposes, has all been proven time and time again. There is, possibly, a casual relationship between the prevalence of tuberculosis and bad housing, especially overcrowding. To make a housing program constructive and effective the health department should start at the very begin-

ning by requiring its approval of all plans for the construction of new dwellings and for the removal or alteration of old dwellings, so that there may be provided sunlight and ventilation, and so that the sanitary appurtenances may be conducive to healthy living.

There are many problems of a strictly engineering character which confront the health officer. There is the question of industrial hygiene which is as much a matter of engineering as of medicine. The obtaining of proper ventilation for the public, the regulation of such physical factors as temperature, humidity, and air movement which have such a marked effect upon the progress of civilization and the development of mental and physical energy are all questions which must be handled by the modern health officer.

In certain sections of our country there is always danger of the importation of plague and yellow fever from some endemic source. The sanitary engineer has contributed much toward the safeguarding of our seaports against plague by rat proofing, and with the cooperation of the laboratorian has conducted rat surveys so as to keep the health officer informed of any impending disaster. In other sections of the country there are conditions of climate and drainage that contribute to the malaria problem, and again there are problems of rural sanitation involving typhoid fever and hookworm which unquestionably merit the attention of the sanitary officer.

The health officer in the final analysis is the one individual who is held responsible for the health of his community, and he should, therefore, have reasonable supervision over the water supply, and should be constantly informed concerning its purity and wholesomeness, and, if necessary, direct activities looking toward the substitution of a suitable supply in case the water used is under suspicion or becomes contaminated. The health officer must be a general consultant on matters of sanitation, and further must be prepared to take the initiative and the lead in all matters pertaining to municipal housecleaning and cleanliness.

ORGANIZATION

In all but 2 of the 100 cities which are the subject of the present study there exists in the health department a bureau or division of sanitary inspection which is almost invariably under the direct supervision of a chief inspector who devotes his full time to such work.

In Denver there is a department of sanitation which is a separate division directly under the mayor. In San Antonio sanitation is a function of the department of parks and sanitation. Several years ago there was a division of the city council in San Antonio and the question arose as to who had the appointment of the health officer, the mayor or the commissioner of parks and sanitation. This matter

was finally taken to court for a decision, and the Texas courts ruled to the effect that public-health work and sanitation were not synonymous, that their functions were different, and, therefore, the health officer should be appointed by the mayor and have supervision over communicable diseases and the food supply of the city. All questions of nuisance abatement, betterment of housing conditions, etc., were left under the department of parks and sanitation.

Sanitary engineers.—In New York City there is a borough chief in charge of sanitary work. In seven¹ cities the work of the sanitary bureau is in the hands of a graduate sanitary engineer. In Duluth and Knoxville the chief inspector is apparently a part-time employee. There is an increasing tendency on the part of municipal health departments to employ engineers who have had college training and who have specialized as civil engineers, sanitary engineers, architectural engineers, or ventilation engineers. Such tendency, which exists in the larger cities and in those places which are confronted by specialized problems, aims to place the work of the sanitary bureau of the health department on a more scientific basis, and one which will, in the long run, be more productive as a life-saving agency.

In Chicago there are five graduate engineers in the bureau of sanitation, two of whom are ventilation engineers, while two others are employed in the division of smoke abatement, the fifth being a special investigator who has supervision over the housing situation.

Ventilation is one of the special activities which has been handled by the trained engineering personnel of the Chicago health department. The city is divided into five districts. The two ventilation engineers act in a supervisory capacity and are, likewise, assigned to special investigations. The ventilation inspectors carry on the activities in their respective districts investigating new buildings, reporting on complaints, etc. The division of ventilation also employs a plan examiner who is required to check all plans for new and old buildings in order to determine whether these plans comply with the city ordinance in so far as light and ventilation are concerned.

In Detroit there are four trained engineers included in the personnel of the sanitary bureau. The sanitary engineer, well versed in problems of water supply, sewage disposal, and municipal sanitation, is in charge. He is assisted by three architectural engineers. Among the duties of these trained individuals are the responsibility for the approval of plans for all new, altered, or remodeled dwellings, supervision over swimming pools, water supplies, mosquito extermination, and special problems in industrial sanitation.

Cincinnati has had a sanitary engineer in charge of the sanitary bureau for some 10 years. His recent departure has, however, left

¹ Chicago, Detroit, Philadelphia, Los Angeles, Cincinnati, Memphis, Seattle.

the department without a man with an engineering degree, although the new man is a graduate of law.

Memphis has one graduate engineer who is in charge of the division of sanitary engineering having as its principal function the control of malaria. This engineer is also in charge of the numerous statistical investigations which have been made by the department.

In Philadelphia and Los Angeles the chief of the division of housing and sanitation is a graduate engineer.

Cleveland, while not having a sanitary engineer regularly employed in the health department, frequently secures the services of such an individual on a contract basis. An engineer has recently been working on odor abatement under the auspices of the Cleveland health department.

Functions.—In all of the cities the health department assumes the burden of nuisance inspection, although in one or two cities there is an effort to transfer a great deal of the nuisance work to a group of police officers who are assigned to the health department for this purpose. Such men are in uniform and subject to the same discipline as the police officer who is directing traffic or preventing crime, and the salary in Detroit and South Bend is paid by the police department, and in Scranton by the public safety department, thus relieving the health department of this added financial burden, and further permitting the health officer to divert the funds which he has thus conserved into other channels which are more productive in the field of disease prevention.

There are 25² cities in which communicable-disease work such as the quarantining and fumigating of premises is done by sanitary inspectors. It may not be amiss at this time to state that in Detroit the placarding of all houses is done by the police department. Immediately upon the report of a contagious disease the registrar of the department communicates by telephone with the precinct station which is nearest the premises to be quarantined and a motor cycle officer is dispatched at once with the quarantine cards, and leaves for the occupants of the house instructions which are to be followed until the arrival of the nurse from the communicable-disease division of the health department, who has charge of the quarantine from that point to the time of dismissal.

In 41³ cities plumbing inspection is still a function of the health

² Buffalo, Cleveland, Cincinnati, Indianapolis, Kansas City (Mo.), Newark, Seattle, Toledo, Dayton, Erie, Fall River, Lowell, Reading, St. Paul, Scranton, Springfield, Trenton, Allentown, Fort Wayne, Harrisburg, Kansas City (Kans.), Lawrence, St. Joseph, South Bend, Wilmington.

³ Baltimore, Buffalo, Chicago, Philadelphia, Pittsburgh, San Francisco, Indianapolis, Jersey City, Newark, Rochester, Seattle, Albany, Atlanta (in 1925 given to construction department), Elizabeth, Erie, Fall River, Flint, Grand Rapids, Lowell, Lynn, New Bedford, Oakland, Omaha, Paterson, Reading, Richmond, Scranton, Tacoma, Trenton, Utica, Worcester, Yonkers, Youngstown, Bayonne, Harrisburg, Lawrence, San Diego, Schenectady, Sioux City, South Bend, Troy.

department, while 44⁴ cities report special emphasis upon housing conditions.

In 10⁵ cities food or dairy inspection is, likewise, a function of the sanitary division. In Atlanta street cleaning is not a function of the health department, as previously reported,⁶ but of the sanitary department of the city, both the health and sanitary departments being under the sanitation and health committee of the city council. Garbage collection is under the health department in 22⁷ cities.

EXPENDITURES

In order to secure a comparable basis and to indicate the per cent of total expenditure for health work which is allotted to sanitary inspection, the budgets of the departments of the cities studied have been so adjusted as to eliminate from consideration all maintenance items for hospitals of whatever nature, garbage collection, plumbing inspection, comfort stations, and poor relief, and to this revised total has been added the sum expended for school hygiene, whether a function of the health department or of the department of education. In those cities, however, where there is a well-developed program of physical education in the public schools the amount spent for such item has not been included, but only that portion which pertains more strictly to school hygiene and to the examination of school children. Thus has been eliminated from consideration any money spent by the board of education for teaching hygiene, for health education, and the development of physical exercise.

This study shows that sanitary inspection receives 16.2 per cent of the total expenditure for health work, and by health work we mean those functions which are now generally accepted as belonging to a health department, including administration, education and publicity, vital statistics, control of communicable diseases, tuberculosis, venereal diseases, infant hygiene, school hygiene, public-health nursing, laboratory, control of milk supplies and other foodstuffs, general sanitation, and housing inspection, but exclusive of all hospital maintenance, medical relief to the poor, industrial and mental hygiene, plumbing inspection, and garbage disposal.

⁴ Buffalo, Chicago, Cleveland, Philadelphia, St. Louis, Boston, Baltimore, Pittsburgh, Los Angeles, New York, San Francisco, Indianapolis, Jersey City, Louisville, Milwaukee, Newark, New Orleans, Portland, Toledo, Camden, Duluth, Elizabeth, Fall River, Grand Rapids, Hartford, Lowell, New Bedford, New Haven, Oakland, Omaha, Paterson, Reading, Trenton, Yonkers, Bayonne, Canton, El Paso, Fort Wayne, Lawrence, Manchester, San Diego, Schenectady, Sioux City, Waterbury.

⁵ Dallas, Dayton, Erie, Fort Wayne, Minneapolis, Memphis, Portland, Rochester, Scranton, Seattle.

⁶ See Public Health Bulletin No. 136.

⁷ San Francisco, Denver, Kansas City (Mo.), Seattle, Albany, Bridgeport, Duluth, Fall River, Houston, Kansas City (Kans.), Lowell, New Bedford, Omaha, Providence, Tacoma, Tulsa, Wilmington, Youngstown, Allentown, Lawrence, Waterbury, Wichita.

The data from 90 cities show that 9.2 cents per capita were spent for sanitation in 1923. The following table shows the per capita expenditure in cities of the four groups studied:

Cities of population	Number of cities	Total population	Total expended by all departments	Expenditure for sanitation	Per cent of total expenditure	Per capita expenditure
						<i>Cents</i>
500,000 and over.....	12	17,340,168	\$9,740,974	\$1,790,756	18.3	10.3
250,000 to 500,000.....	15	5,180,013	3,000,288	461,177	15.3	8.9
100,000 to 250,000.....	45	6,549,907	3,777,488	483,406	12.8	7.4
70,000 to 100,000.....	18	1,584,039	889,023	101,300	11.4	6.4
All cities.....	90	30,654,127	17,409,773	2,836,649	16.2	9.2

In 39 of the 41 cities in which plumbing inspection is a function of the health department the cost per capita for such service in 1923 was 6.5 cents. It is of interest to know that the total amount spent for plumbing inspection in these cities was \$353,741.89, which, if diverted to more strictly health matters, would enable considerable expansion in the maintenance of tuberculosis and venereal disease clinics, and in improving child health.

In Atlanta plumbing inspection was a function of the health department in 1920, but in 1925 had been transferred to the construction department.

PERSONNEL

In most instances the work of nuisance prevention and abatement and housing inspection is a function of a group of inspectors, whose time is interchangeable between the two activities and it is, therefore, virtually impossible to make any tabulation which will accurately portray the number of inspectors engaged in nuisance work, and the number engaged in purely housing work, together with the corresponding salaries and total expenditures. Therefore, so far as personnel is concerned, these two functions have been treated as one.

In the 100 cities there are 984 inspectors and 138 other employees, including stenographers, clerks, helpers, etc., who are engaged in this service. The following table shows the number of inspectors per 100,000 population in each group of cities.

Cities of population	Number of cities	Total population	Total number of inspectors	Inspectors per 100,000 population
500,000 and over.....	12	17,340,168	395	2.2
250,000 to 500,000.....	16	5,589,138	273	4.8
100,000 to 250,000.....	50	7,310,265	251	3.4
70,000 to 100,000.....	22	1,915,525	65	3.3
All cities.....	100	32,155,096	984	3.0

NUISANCE INSPECTION

As has been stated no attempt has been made to divide the personnel employed in nuisance control from that employed for housing inspection, as in most cities the same inspectors serve both purposes. The scope of nuisance inspection seems to include everything pertaining to health and comfort, and the habit has developed on the part of the public to lay their complaints before the health officer even though their association with disease may be extremely remote. In only 38 cities does the health department claim to make a house-to-house inspection of sanitary conditions on its own initiative and, doubtless, in most of these instances the amount of cycle inspection conducted by the department is small when compared to the complaint work. Fortunate, indeed, is the health department which can minimize complaints and devote most of its time to a periodic systematic visitation of all premises in the city in a regular methodical fashion. Only by this type of inspection is it possible to eliminate the personality of the complainant. It would be interesting to know in what per cent of cases the inspector reports "no cause for action" and finds that the health department has been put to the expense of inspection merely to gratify the desire of some citizen whose sole purpose is to get even with some neighbor with whom he has had a petty quarrel.

While virtually all health departments report that records are kept in a most complete fashion, there are very few which could give a full statement of the number of reinspections made and the number of nuisances actually abated.

SANITARY POLICE

In Buffalo a city policeman is assigned to the bureau of communicable diseases whose duties are to enforce quarantine and make other investigations in connection with the work of the health department. The salary in this case is paid by the police department.

In Boston, in addition to the 43 sanitary inspectors of the health department, there are 3 police officers who are members of the regular police force of the city, detailed to the health department. They are in uniform and have the power of arrest; their salaries are paid by the health department.

Cleveland has a sanitary police service whose function includes other work than the sanitation of premises such as quarantine enforcement, food inspection, antirabic measures, special investigations, court cases, etc. These men all have full police power, wear uniforms, are armed, and their salaries paid by the division of health.

In South Bend there are two sanitary police officers who are detailed from and paid by the police department. These men are in

uniform, carry arms, and have the power of arrest. Their function is to secure the abatement of all nuisances, in addition to which they establish quarantine for communicable diseases.

There is not only a great variation in the organization of the sanitary police service in the 19 cities which report having such a group of officers in the health department, but there is likewise a great variation in the functions of such officers. Detroit, South Bend, and Scranton provide the only instances in which the salaries of the sanitary police are paid by the police department. In Detroit, in addition to the regular housing inspectors employed by the health department, there is a provision in the police budget for 25 police officers known as the sanitary squad. These men serving under a sergeant are permanently attached to the health department and receive all instructions from the health commissioner and the sanitary engineer. In all other respects they are regular members of the metropolitan police department; are fully armed, in uniform, have the power of arrest, and are subject to the same discipline as all other members of the police force.

There are 19 cities in which there is a sanitary police organization, the salaries being paid by the health department. In 15 cities such men are in uniform. In 17 cities these officers have the power of arrest. In 6 cities the sanitary police officers are fully armed.

PLUMBING INSPECTION

As has already been stated plumbing inspection is a function of the health department in 41³ cities. In many States there are laws which provide for such control, while in other instances a city ordinance inflicts this responsibility upon the health department. The health officer usually provides for the examination of plumbers, the issuance and the renewal of licenses to master and journeymen plumbers, issues permits for the construction of new work, and not infrequently examines plans for plumbing in new and old buildings.

In Detroit there is a board of examiners of plumbers consisting of five members, a representative from the health department, from the building department, and the city engineer and a master and journeyman plumber, who are chosen by the board of health. This board of examiners is responsible for the theoretical and practical examination of all applicants for licenses and formulates the plumbing code subject to the approval of the board of health. The inspectorial service is provided by the building department, thus relieving the health department of the financial burden, but at the same time enabling the health department to maintain a guiding hand in the formation and enforcement of a suitable code.

³ See footnote, p. 528.

In 35 cities of the 41 cities which have a plumbing division in the health department there is a chief inspector whose salary varies from \$3,600 in Flint to \$1,800 in Troy, Utica, and Lynn. The following table shows the number of inspectors per 100,000 population and the number of annual plumbing inspections per 1,000 population in 33 cities giving this data:

Cities of population	Number of cities	Population	Number of inspectors	Number of inspectors per 100,000 population	Total number inspections	Inspections per 1,000 population
500,000 and over.....	5	6,659,095	62	0.9	243,125	38.0
250,000 to 500,000.....	4	1,370,723	16	1.1	34,698	25.3
100,000 to 250,000.....	18	2,578,592	42	1.6	70,781	27.4
70,000 to 100,000.....	6	512,060	9	1.7	11,517	22.4
All cities.....	33	11,120,470	129	1.1	360,121	32.1

HOUSING

Innumerable studies made in this country and abroad warrant the conclusion that certain housing factors play a very important rôle in disease dissemination. Bacteria of every variety live and flourish in a dark, damp atmosphere where the temperature is suitable for their growth. Sunlight is our best known germicide, and in most cities has superseded formaldehyde as a means of terminal disinfection in cases of communicable disease.

The apartment house with poorly ventilated rooms, with inadequate ceiling height, with cellar or basement unprotected by damp-proofing, is a definite health menace. It is obvious that the proper way to correct this evil is to start at the very beginning and require through a suitable ordinance or housing code that all plans and specifications of dwellings shall be submitted for the approval of the health department prior to the construction of the dwelling. The enforcement of such a provision may be taken care of in many different ways. The plans could be inspected by plan examiners of the building department who have been especially trained for such work. The architect or owner may be requested to submit his plans to each department independently, or what is probably more satisfactory is to have the health department detail plan examiners to the building department so that the owner or architect may at one operation secure the stamp of approval of both divisions of the city government. The health department is interested in matters of light, ventilation, and sanitation, as represented by the size of courts, yards, ceiling heights, per cent of window area to floor area, etc., while the building department is interested in questions of structural strength, fire hazard, etc.

Data from 68 cities indicate that something is being done to control the housing situation. Forty-six⁸ cities report a city ordinance under which they operate. Eleven⁹ cities report a State law, while 11¹⁰ cities report that they operate under both a city ordinance and a State law. Four¹¹ cities answer "yes" on questionnaire but do not specify type of legal provision. In 28¹² cities there is no housing code whatsoever.

In Washington, D. C., there is a board known as a board for condemnation of insanitary buildings, which board is composed of three officials, namely, the assistant to the engineer commissioner, the inspector of buildings, and the health officer. The function of this board is to inspect and act in cases of buildings which are old, insanitary, or in bad structural condition, and the board has the authority to cause the necessary repairs to be made or the building removed. This board is not attached to any department of the District government but functions independently.

Plan Examination.—In Philadelphia all plans for the erection or alteration of dwellings must be submitted to the chief of the division of housing and sanitation for the approval of the sanitary requirements of such plans. A special act of the Pennsylvania Legislation creates a State housing code which is enforced in Philadelphia.

In Buffalo the bureau of sanitation is charged with enforcement of the New York State tenement law including all new and old buildings occupied by three or more families; also the enforcement of the city ordinances relating to lodging, rooming, and boarding houses, including hotels. All plans for new tenements, lodging, rooming, and boarding houses, and hotels, must be approved by the bureau of sanitation as well as all alterations, additions, etc., including questions of light, ventilation, and sanitation.

Chicago, operating under a State law passed in 1881, provides for the examination of plans for new and remodeled buildings with respect to light, ventilation, plumbing, and drainage. The Chicago municipal code and its building ordinances and zoning requirements

⁸ Boston, Baltimore, Cleveland, New York, Pittsburgh, St. Louis, Cincinnati, Columbus, Denver, Kansas City (Mo.), New Orleans, Portland, Rochester, Toledo, Atlanta, Birmingham, Bridgeport, Cambridge, Camden, Dayton, Des Moines, Duluth, Elizabeth, Erie, Fall River, Kansas City (Kan.), Lowell, Memphis, Nashville, Paterson, Reading, Salt Lake City, Springfield, Yonkers, Allentown, El Paso, Evansville, Knoxville, Harrisburg, Lawrence, Manchester, St. Joseph, Schenectady, Somerville, South Bend, Waterbury, Wilkes-Barre.

⁹ Philadelphia, Indianapolis, Washington, Akron, Hartford, Oakland, New Haven, Canton, Fort Wayne, Sioux City.

¹⁰ Buffalo, Chicago, Detroit, Los Angeles, San Francisco, Jersey City, Minneapolis, Milwaukee, Flint, Scranton, Youngstown, San Diego.

¹¹ Louisville, Seattle, Grand Rapids, St. Paul.

¹² Newark, Albany, Dallas, Fort Worth, Hartford, Houston, Jacksonville, Lynn, New Bedford, Norfolk, Oklahoma City, Omaha, Providence, Richmond, San Antonio, Spokane, Syracuse, Tacoma, Trenton, Tulsa, Utica, Wilmington, Worcester, Bayonne, Peoria, Savannah, Troy, Wichita.

provides for the examination of plans with respect to light, ventilation, and sanitation, including such items as size of yard, size of court, size of rooms, etc.

In Columbus the health department approves plans for alterations of old buildings, but not for new buildings.

Overcrowding.—Virtually all cities included in the survey report that in some sections of the city overcrowding exists at least to a limited extent. Such condition is more frequently encountered in the sections occupied by colored people, or those who have more recently arrived from foreign countries.

Model housing.—In Milwaukee, Bridgeport, Bayonne, Canton, and Duluth a model housing development is reported.

During the war there was a very considerable amount of building at Bridgeport for the purpose of providing homes for working people. With the close of the war these houses were purchased by a local organization, The Bridgeport Housing Co., although a number of such houses were sold to private individuals.

In Duluth the United States Steel Corporation has developed a model housing enterprise at Morgan Park, which is known as "Model City." The director of public health reports that the corporation has overlooked nothing in the construction of this housing development in so far as light, ventilation, and sanitation are concerned.

The Garden Homes Co., in Milwaukee, is a project established during the war to provide model homes for people of moderate means at as low a price as possible. It was organized by a grant from the city, from the county, and from private individuals. A number of homes have been built, provisions having been made whereby the occupants of such homes are able to purchase them on a small-payment basis.

Certain cities report that all lodging houses are inspected annually and are not permitted to operate without a permit from the department of health. Certain cities report that all tenement houses are inspected annually and are not permitted to operate without a permit from the department of health. Other cities report that all hotels are inspected annually and are not permitted to operate without a permit from the department of health.

SMOKE INSPECTION

Smoke is to some extent at least a nuisance in nearly every city. Its presence tends to reduce the amount of sunlight which can reach the people of our large cities, and more especially of the ultra-violet rays, which are so essential to normal development in the human body and are an important factor in the prevention and treatment

of such diseases as rickets and tuberculosis. Studies made in the congested areas of some large cities and repeated in the more rural districts near by such cities have shown that the light intensity in the city is materially decreased by the smoky and misty atmosphere which overlies an industrial community. With the increasing practice of a substitution of sunlight and cleanliness for gaseous terminal disinfection in communicable diseases, it may readily be seen that a smoky atmosphere has its direct influence upon health.

Because of the factors involved in the prevention of smoke the majority of health officers apparently have come to the conclusion that smoke prevention is not necessarily a problem for the health department any more than street cleaning or garbage collection. The health department is materially interested as, likewise, it is interested in cutting down the number of street accidents. On the other hand, the best way to prevent smoke is to so construct a fire box as to insure more complete combustion of carbon. With this in mind smoke inspection may well be a function of the city building or engineering department.

In Pittsburgh and Chicago the health department is doing something for the smoke problem. In other instances the city obtains relief through the cooperation of the State.

GARBAGE AND REFUSE DISPOSAL

In 22⁶ cities this is a function of the health department. In all other instances this service is performed by some other department; in eight¹³ cities by the department of street cleaning, and in 28¹⁴ cities by the department of public works. The extent of control by the health department varies considerably, more especially in accordance with the method of garbage disposal. Where rubbish and refuse is disposed of at city dumps the garbage must be kept out of such refuse, and this responsibility usually rests with the health department.

In cities where the reduction method of garbage disposal is employed a complete separation from rubbish and refuse must be made by the householder, and the enforcement of such separation is usually a function of the health inspector, or of the police officer who is detailed to the health department for such service.

In 62 cities garbage is collected in water-tight wagons, trucks, or trailers. In 27 cities it is stated that garbage is collected by private

⁶ See footnote, p. 529.

¹³ Baltimore, St. Louis, New York, Hartford, Jacksonville, Omaha, Cambridge, Bayonne,

¹⁴ Chicago, Cleveland, Detroit, Los Angeles, Philadelphia, Akron, Birmingham, Dayton, Grand Rapids, Elizabeth, Nashville, New Haven, Paterson, Richmond, St. Paul, Syracuse, Utica, Yonkers, Norfolk, Scranton, Troy, South Bend, Evansville, Fort Wayne, Savannah, Schenectady, Canton, Knoxville.

contractors or farmers, but little information is given concerning the details of methods employed or equipment used. In practically all cities garbage is collected two to three times per week in residential sections and daily from hotels, cafés, restaurants, and other places in which food is served.

In Minneapolis all domestic garbage is placed in paper, usually newspaper, at the home and is collected by the garbage department, under the city engineer. Such collection service is extended only to private homes, or multiple residences, and the city does not make a collection for food-handling establishments, hotels, cafés, etc. The garbage properly wrapped and tied is placed in water-tight covered cans for collection. Most of the garbage collected by the city is sold for hog feed. Only that portion that is not disposed of by sale, or which because of road or weather conditions is not hauled away, is incinerated. The city also undertakes to dispose of garbage in wholesale quantities taken to the crematory plant by private owners, a fee being charged for such garbage incinerated. The wrapping of garbage has proven very satisfactory, but has required the education of the public, as without such cooperation the system would not be practical.

In Fort Wayne garbage is drained and wrapped and placed in regulation size garbage cans. The board of public works collects and disposes of it. Inspectors of the sanitary division of the health department have authority to see that garbage is wrapped and drained and placed in proper containers for collection.

The method of final disposal most frequently indicated was by feeding to hogs in 42¹⁵ cities. In 20¹⁶ cities the reduction process is used. In 24¹⁷ cities incineration, while in 10¹⁸ cities dumping on land and in 2¹⁹ dumping partly at sea is the method of final disposal.

DISPOSAL OF DEAD ANIMALS

In the majority of cities dead animals are collected and disposed of in the same manner as garbage. In 47 cities a contract has been

¹⁵ Buffalo, St. Louis, Denver, Kansas City (Mo.), Memphis, Newark, Seattle, Albany, Akron, Cambridge, Camden, Des Moines, Erie, Fall River, Flint, Grand Rapids, Hartford, Kansas City (Kans.), Lowell, Lynn, New Haven, Oakland, Providence, St. Paul, Salt Lake City, Springfield, Tulsa, Worcester, Allentown, Canton, Evansville, Fort Wayne, Harrisburg, Lawrence, Manchester, St. Joseph, San Diego, Sioux City, Waterbury, Wichita, Somerville, Wilkes-Barre.

¹⁶ Baltimore, Boston, Detroit, Chicago, Cleveland, Los Angeles, Philadelphia, Cincinnati, Columbus, Indianapolis, Rochester, Toledo, Washington, Bridgeport, Dayton, Reading, San Antonio, Syracuse, Schenectady, Yonkers.

¹⁷ New York (Queens and Richmond), San Francisco, St. Louis, Milwaukee, Minneapolis, New Orleans, Atlanta, Dallas, Duluth, Fort Worth, Houston, Jacksonville, Memphis, Newark, Paterson, Richmond, Scranton, San Diego, Spokane, Trenton, Wilmington, Youngstown, Knoxville.

¹⁸ Jersey City, Elizabeth, Nashville, New Bedford, Omaha, Tacoma, Bayonne, Birmingham, Savannah, South Bend.

¹⁹ New York (Manhattan and Bronx), Oakland.

made to some private rendering plant for the collection of animals, more especially dead horses and dogs. The health departments have only supervisory control over this work.

While in most cases the health department does not actually render the service of collecting dead animals, it must assume the responsibility of assuring the public that adequate means will be provided for such collection, and must maintain sufficient supervision to insure that the service rendered by others is prompt and adequate.

DISPOSAL OF STABLE MANURE

With the advent of the automobile the horse-drawn vehicle is rapidly disappearing from the more congested metropolitan areas. There are, however, certain delivery services which can still be handled more economically and satisfactorily with horses, among which may be mentioned the delivery of milk and ice. While the opportunity for accumulations of manure have been diminished, they still exist, and as a manure pile provides an ideal breeding place for flies, it is essential that when stored manure should be kept in fly-tight, properly covered, and ventilated boxes. The enforcement of the regulations providing for such containers is almost invariably a function of the sanitary officer of the health department.

In many of the large cities manure is collected by the city, but the cost of such collection is met by the property owner. Because of its usefulness as a fertilizer, most of the manure in the smaller towns is promptly collected and hauled away by farmers.

There is scarcely a city which has not carried on a special educational campaign against the fly. Tons of literature have been used and innumerable talks have been given on the subject. Not infrequently there have been special fly campaigns, some of which have been admirably organized and well backed financially. The fly presents more of a health problem in the Southern States and cities, where the summer season is longer and where the facilities for sewage disposal have been somewhat less adequate.

STREET CLEANING

In no case is street cleaning a function of the health department, but in many cities the health officer serves as an advisor in all matters pertaining to municipal sanitation and cleanliness, including street cleaning. In 35²⁰ cities there is a special street cleaning department,

²⁰ Baltimore, New York, St. Louis, Cincinnati, Denver, Jersey City, Kansas City (Mo.), Milwaukee, Birmingham, Cambridge, Des Moines, Erie, Fall River, Fort Worth, Hartford, Houston, Jacksonville, Kansas City (Kans.), Lowell, Nashville, New Bedford, Oakland, Omaha, Reading, Salt Lake City, Trenton, Tulsa, Wilmington, Worcester, Allentown, Lawrence, St. Joseph, Schenectady, Sioux City, Waterbury.

while in 39 ²¹ cities this work is a function of the department of public works. There are a few instances in which street cleaning is a function of some other division of municipal administration, but in general the responsibility for this work is assigned to a service department or to one of the engineering bureaus of the municipality. Virtually all types of equipment are utilized in securing clean streets, although the most common method seems to be a combination of flushing, sweeping, and the use of a "white wing" patrol.

TOURIST CAMPS

With the changing means of transportation for tourists, the automobile having partially superseded the railroad train and the steamboat, there have developed within or adjacent to most large cities one or more tourist's camps. As a rule these camps present no special problem in the large city where water, sewers, and other sanitary conveniences are readily obtainable. It is only in the smaller class of cities which are not covered by this survey, and in the rural areas, that the tourist's camp presents a difficult problem. Many of the large cities have very excellent tourist's camps with every possible modern convenience for the welfare, safety, and comfort of the tourist. Laundries have been constructed, dormitories and mess rooms have been provided, all properly equipped, maintained, and inspected.

SWIMMING POOLS AND BATHING PLACES

There is no form of exercise which brings into more general use all the muscles of the body than does swimming. Swimming is becoming as popular in winter as it is in summer. The construction of swimming pools in the public schools and the organization of divisions of physical education under the boards of education has done much to focus interest in this form of recreation. Of late the swimming pool has demanded the attention of the physician, more especially the otologist and, likewise, the sanitary engineer. A clean swimming pool can be maintained and the bacteria count kept within the bounds of sanitary requirements, and a dirty pool should not be permitted to operate. Some of the infections which have occurred following the use of swimming pools are due to autogenous infections, and the presence of bacteria in small numbers in swimming pools can not be held wholly accountable.

²¹ Boston, Buffalo, Chicago, Cleveland, Detroit, Los Angeles, Philadelphia, San Francisco, Columbus, Indianapolis, Louisville, Newark, New Orleans, Portland, Rochester, Akron, Albany, Bridgeport, Dayton, Duluth, Elizabeth, Grand Rapids, New Haven, Norfolk, Oklahoma City, Paterson, Richmond, St. Paul, Scranton, Spokane, Syracuse, Tacoma, Yonkers, Youngstown, Evansville, Fort Wayne, Peoria, Savannah, South Bend.

There are 56²² cities in which the health department maintains some supervision over swimming pools and bathing beaches. In these cities there are 644 swimming pools and bathing places receiving such supervision which consists most frequently of bimonthly inspection and water sampling, but not infrequently is such inspection made every week and in some cases daily. A daily inspection with the publication each month of a rating of the pools will do much to stimulate interest on the part of the pool operators. Constant and careful supervision and the enforcement of sanitary regulations for the bather himself will go far toward securing a satisfactory score. Thirty-three²³ cities report that chlorination is used for the treatment of swimming-pool water, while two²⁴ cities report the use of ultra-violet ray in combination with filtration. In 12²⁵ cities it is reported that both chlorination and ultra-violet ray sterilization are generally employed.

MOSQUITO CONTROL

Seventy-seven cities report that no special measures are employed for the control of mosquitoes. In 23 cities the health officer reports that in his judgment mosquito control requires the special attention of some branch of the city government.

In New York City approximately \$100,000 has been expended annually for control measures on salt marshes, inland swamps, and local breeding places. This work is under the supervision of a full-time sanitary engineer.

Baltimore reports having expended \$20,000 per year for control measures. Los Angeles reports having undertaken drainage and oiling measures. St. Louis spends about \$5,000 annually in oiling ponds and other breeding places.

There are two cities in the second group studied which report special activities in the control of mosquitoes. New Orleans spends \$2,700 annually, while Newark has spent nearly \$70,000 annually on the salt-water meadows and lowlands which adjoin that city. The

²² Boston, Buffalo, Chicago, Cleveland, Detroit, New York, Philadelphia, San Francisco, St. Louis, Cincinnati, Louisville, Milwaukee, Newark, Portland, Rochester, Seattle, Toledo, Atlanta, Dayton, Des Moines, Grand Rapids, Hartford, Houston, Jacksonville, Kansas City (Kans.), Lowell, Memphis, Nashville, New Haven, Oakland, Oklahoma City, Omaha, Reading, Richmond, St. Paul, Salt Lake City, Scranton, Spokane, Springfield, Syracuse, Tacoma, Trenton, Tulsa, Youngstown, Bayonne, El Paso, Evansville, Fort Wayne, Knoxville, Manchester, St. Joseph, San Diego, Sioux City, Waterbury, Wichita, South Bend.

²³ Boston, Buffalo, Cleveland, New York, San Francisco, St. Louis, Louisville, Newark, Rochester, Seattle, Toledo, Atlanta, Dayton, Hartford, Houston, Kansas City, (Kans.) Lowell, Nashville, New Haven, Oakland, Reading, Richmond, Scranton, Spokane, Tacoma, Bayonne, El Paso, Fort Wayne, Manchester, St. Joseph, San Diego, Waterbury, Wichita.

²⁴ Knoxville, South Bend.

²⁵ Chicago, Detroit, Cincinnati, Milwaukee, Portland, Des Moines, Memphis, Oklahoma City, St. Paul, Tulsa, Sioux City.

work in Newark is supervised by a consulting engineer, chief engineer, and two field supervisors.

There are several cities in the third group which pay particular heed to the mosquito problem, and more especially is this true of the cities in the South, where the weather is warmer and where malaria is more prevalent. Among the cities which are carrying on extensive campaigns are Birmingham, Elizabeth, Dallas, Houston, Jacksonville, Memphis, Paterson, Providence, and San Antonio.

In the fourth group of cities El Paso and Savannah are using extensive control measures.

In all instances drainage operations have been undertaken and oil is extensively used on accumulations of water. In addition to this educational and clean-up campaigns have been instituted in order to secure the generous cooperation of the householders. Screening of homes has received special consideration.

RODENT EXTERMINATION

In the majority of the cities which have been the subject of this study rat extermination is not considered a health problem, but rather an economic problem which has been taken care of by private concerns and not by public agencies. There are, however, a number of seaport towns which have not infrequently instituted rat surveys to ascertain whether there is any possibility of the rat harboring the plague flea, and in some instances these rat surveys have been undertaken in inland communities at times when plague has existed at some American seaport. Not infrequently is the city health department materially assisted by the United States Public Health Service and in some instances, as in New Orleans, the greater portion of the financial burden is carried by the Federal Government.

In New Orleans between December 2, 1924, and January 17, 1925, 12 plague-infested rats were reported by the rodent plague laboratory. As soon as possible after the notification of the first rat the United States Public Health Service, in cooperation with the New Orleans city and Louisiana State board of health, instituted a rodent plague survey. Both human and rodent cases occurred in New Orleans in 1914, and an extensive rat-eradication and rat-proofing campaign was prosecuted during the period from 1914 to 1917. A recurrence of plague in 1919 resulted in a similar campaign which was concluded in June, 1923. Surg. C. V. Akin, medical officer in charge of the rodent plague survey, under the auspices of the United States Public Health Service at New Orleans, reported that by December 16, 1924, a relatively large survey organization had been effected.

Intensive trapping was first begun on and near the Mississippi water front and as rapidly as possible additional territory was covered, and by the end of January, 1925, an area of roughly 35 square miles was being trapped. A squad consisted of a foreman and seven trappers, and there have been as many as 17 squads in the field at one time. A man of many years' experience was assigned as inspector and supervisor in charge of trapping operations. The immediate supervision of trapping was delegated to three chief trappers, each of whom was responsible for the work of some five or six squads. Each squad was assigned to a district. A small automobile truck was used for collecting the rats and delivering the catch to the laboratory. The laboratory force consisted of a highly trained technician, who subjected each rat to visual examination after it had been opened. Four assistant technicians record the location where the rats were captured, fix the bodies to shingles, and incise and reflect the skin prior to the examination above referred to. Daily trappings have averaged about seven rats per man. The personal costs of this work are as follows:

	Per month
Inspector of trapping-----	\$180
Chief trappers-----	150
Foreman trappers-----	125
Rat trappers (plus a bounty of 10 cents for each rat caught and properly tagged) -----	95
Chief laboratory technician-----	145
Assistant laboratory technician-----	115-125

The above, of course, does not include the salary of the medical officer in charge. The truck driver, yard foreman, bait cutters, etc., are paid the trapper's salary, but receive no bounty. A clerical force employed for the survey costs about \$325 per month, and the total expense for each rat examined has amounted to \$0.96.

The above outline of the work in New Orleans has been given in detail as it represents a well-directed survey, not dissimilar to surveys which have been pursued elsewhere. Among other seaports which report intensive rodent extermination work are New York, Los Angeles, Portland, Oakland, San Francisco, Camden, Seattle, and Savannah.

Early in the year 1920 a study was made in relation to the vulnerability of New York City to bubonic plague and surveys were made of the water front, especially that portion where ships sailing from foreign ports were docked; also dumps, stables, and other places where rat breeding and rat harborages were likely to exist.

A special squad of inspectors was organized and detailed for rat trapping along the water front. Rats were removed to the laboratory for examination, but all examinations proved negative. Various rat

poisons and rat-catching devices were placed at public dumps to reduce the number of rats and remarkable results are reported. From April 16, 1920, to August 31, 1921, 20 rat trappers were employed and a total of 31,042 inspections was made. During this period 12,711 rats were captured. In 1922 the rat-trapping squad was reorganized and 26 trappers were detailed to this work, which resulted in the capture of 21,090 rats. During 1923 a new procedure was instituted whereby fleas were obtained from the live rats. Rats caught in cage traps are suspended over a water bath and as the body becomes cold the fleas leaving it are caught in the bath. Samples were sent to the United States Public Health Service in Washington. During 1923 there were 19 rat trappers and 19,076 live rats were trapped for flea examination.

DISCUSSION AND SUMMARY

While general sanitation still plays a leading part in the organization of a municipal health department we predict that the percentage of the total expenditure allotted to this service will tend to decrease as compared with the amount of money assigned to the educational activities of the modern health department such as tuberculosis, infant welfare, and school services. There seems to be an increasing tendency to eliminate many activities which in the past have found their way into the health department, but which can satisfactorily be made a function of some other division of the city government. The most prominent function in this group is that of plumbing inspection.

It is gratifying to notice the increasing tendency to employ well-trained sanitarians and more especially sanitary engineers for executive positions in the field of sanitation. Accompanying this movement there naturally follows a tendency to eliminate the unnecessary and unprofitable activities and to substitute in their place an active participation on the part of the health department in the larger problems of municipal sanitation, involving the extension of the water supply, the sewerage system, sewage disposal, ventilation, industrial hazards, swimming pool sanitation and the like. It is thought that a well-trained sanitarian as head of a bureau of sanitation can adequately train his personnel if there be no political interference. It is unnecessary that every inspector be an expert health man. It is more important that such inspectors should be men of average intelligence, keenly alert to their responsibilities, willing to learn and not afraid of work. Wherever possible the control and abatement of nuisances should become a function of the police department acting under the general guidance of the health department.

In some cities there seems to be no definite conception as to what constitutes a nuisance and in the absence of a sanitary code with adequate definitions, the health department is becoming the dumping ground for complaints of every character which are not handled by other city departments. This tendency has placed an unfair burden upon the health officer and has diverted certain funds which might more profitably be spent in a different direction. The public is not to blame for this situation since the sanitarian of the past century preached the gospel of environment and the importance of insanitary premises as a factor in the dissemination of disease. Without doubt, property owners have been put to much unwarranted expense in the reconstruction and improvement of their premises under the guise of public health, but on the whole it is doubtless true that while there have been some injustices, the enforcement of the sanitary laws have resulted in inestimable good. The maintenance of a clean abode, the avoidance of dirt and filth, can not fail to stimulate an unconscious desire on the part of the individual to keep his person cleaner, neater, and consequently freer from infection. There is still a happy balance between the two situations and it is impossible to fix a hard and fast rule to serve as a guide for all municipalities. The emphasis which must be placed upon sanitation will vary with the climate, with the nature of the population and the degree of intelligence of the average citizen. Some large cities have vast outlying areas, which are rural in character where water and sewerage facilities are inadequate, and here there exists considerable demand for the sanitary inspector. As the municipality becomes better organized, more stable in its population and as the citizens become more enlightened in matters of health, there will be a decreasing need for the sanitary inspector.

There seems to be little to add to the recommendations already made for a bureau of sanitation in an ideal health department for a city of 100,000 inhabitants. The health department must still assume the responsibility for general nuisances and the inspection and supervision of housing conditions in occupied buildings. If the approval of plans for new dwellings is not a function of the health department, its sanitary division should at least be alert to the possibility of bad housing as a factor in the spread of tuberculosis and other communicable diseases. The health department should make certain that the building code contains reasonable regulations with respect to the lighting, ventilation and sanitation of all new dwellings. To permit the construction of veritable tuberculosis factories and then endeavor to control this disease by the inspection of such dwellings constitutes a poor policy. The inspection of plumbing in new buildings should not be a health department function. Likewise, the col-

lection of garbage and refuse should be handled by one of the engineering departments of the city rather than by the health department. We wish to lay renewed emphasis upon the desirability of maintaining a systematic inspection service for existing dwellings and premises as well as provision for the adequate handling of complaints. A simple record system can always be devised. No unnecessary bookkeeping should be involved. It is possible to keep a simple record for each of the premises with which the health department has contact. The complete history of the case need be made a permanent record only in instances involving the expenditure of considerable sums of money or demanding improvements of a more or less permanent character. To keep a complete file of all clean-up orders would result in needless expenditure for clerks and record files.

As previously recommended, particular need should be paid to four problems of sanitation, namely:

- (1) Privy vaults.
- (2) Stable manure.
- (3) Mosquito breeding.
- (4) Rat breeding.

The degree of emphasis to be placed upon these important items will depend upon local conditions such as climate, percentage of dwellings served with sewers, the local prevalence of malaria, yellow fever, plague, etc.

The previous report recommended that a reasonable organization for a bureau of sanitation for a city of 100,000 population should consist of the following, with which we concur in so far as the personnel itself is concerned. The amount to be paid the chief of bureau and inspectors and clerk will depend upon the local economic situation.

Salaries :

Chief of bureau.....	\$3, 500
Four district inspectors.....	6, 000
Clerk.....	1, 000
Maintenance.....	1, 000
Total.....	<hr/> 11, 500

SECTION II

SUMMARY OF HEALTH DEPARTMENT ORGANIZATION AND SERVICES IN THE INDIVIDUAL CITIES

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INTRODUCTION

The preceding sections have presented for the 100 cities combined, and by groups, summaries of the various public-health functions considered essential in a modern health program. Such a presentation gives an excellent cross section of health practice in the large cities, but necessarily includes only occasional references to specific procedures in individual communities. As a supplement to Section I it has, therefore, been thought desirable to present a compact picture of the health procedures in each individual city. The value of this twofold mode of presentation has been demonstrated since the publication, in Public Health Bulletin No. 136, of the Report of the Committee on Municipal Health Department Practice, based on data for the year 1920. The reader may thus gain information concerning health organization, practices, costs, and results in each of the large cities, as well as for the groups of cities of various sizes and locations. Opportunity is also afforded for comparison of the situation in 1923 with that in 1920.

As pointed out in the summary of health department organization and services in each of the cities surveyed in 1920, there are many opportunities in a presentation of this character, based primarily upon questionnaires, for errors which may work an injustice to the community concerned and the health officer responsible for administration, and may also militate against the value of the study as a whole. The text of these summaries as first prepared was based upon the questionnaire of the United States Public Health Service, supplemented by data secured by the field director's office of the Committee on Municipal Health Department Practice of the American Public Health Association. To avoid the possibilities of error, however, the text was sent in each instance to the health officer for his correction and criticism. The individual health officers were most cooperative in availing themselves of this opportunity to make corrections and in supplying information concerning progress since

1920. The preliminary text, corrected in this manner, was again sent in its final form when ready for publication to each health officer for his approval. Only some minor corrections were thereafter made in the text.

It is desired to emphasize the fact that the information given in this section applies to the year 1923. In certain instances mention has been made, usually by footnotes, of outstanding progress or notable changes in personnel, procedure, or results which have occurred since 1923. Otherwise the data presented represent conditions during the year 1923.

The populations used are estimates as of July 1, 1923, as published weekly in Public Health Reports, while the broad classifications by race were those usually made at the time of the survey by representatives of the United States Public Health Service. Under the heading "Expenditures," the term "health purposes proper" has been used to include the health functions enumerated and described for each city and does not include either hospital care or the collection and disposal of garbage, refuse, or street cleanings. As in the report for 1920, under the heading "Laboratories," the ratio of diagnostic examinations per 1,000 of population refers always to the laboratory diagnostic tests of all kinds to determine the presence of communicable diseases, but does not include laboratory procedures used in the examination of milk, water, foods, and drugs or miscellaneous chemical analyses.

In calculating the ratio of public-health nurses per 100,000 of population the nurses employed by the departments of health and education and by private nursing organizations are included, but not those employed by industrial plants. The supervisory staff of nurses is always included in the estimate.

Public-health work is in process of such rapid expansion that to the more progressive cities in particular some injustice may have been done through inability to bring every report up to the date of publication. Noteworthy progress in health work between 1920 and 1923 is indicated in the outline of health practice for many of the cities which were included in the earlier survey and for certain of the 17 additional cities surveyed for the first time according to this plan. It is stimulating to note this progress in health administration and helpful to observe the programs and the methods employed in the separate cities.

SUMMARY OF HEALTH DEPARTMENT ORGANIZATION AND SERVICES

AKRON, OHIO

Akron is an industrial city of 208,435 population distributed over an area of 22.7 square miles, giving a population per square mile of 9,182. The population was classified as being 79.1 per cent native white, 18.2 per cent foreign born, and 2.7 per cent colored people. The taxable valuation was \$1,520 per capita.

Administration.—The city is governed by a mayor, manager, and council. A health commission of five members without salary is appointed by the mayor for terms of five years each. Two members of this commission must be physicians. Monthly meetings are held. The director of health is appointed by the health commission on a full-time basis, for a period of three years at a salary of \$5,000 plus transportation. Health work is performed under eight functional headings.

Expenditures.—The total budget of the health department amounted to \$0.66 per capita of which \$0.06 were spent for hospitalization of contagious diseases. This compares with \$0.58 for health purposes in 1920.

Vital statistics.—Registration of vital statistics is conducted by the health department under the supervision of a full-time registrar. The International List of the Causes of Death is used and both birth and death certificates are checked. Reports are published monthly and distributed to the members of the health commission, city officials, and to various other departments.

Communicable-disease control.—Communicable disease control is handled by a full-time director with two full-time and two part-time medical assistants. A study of the ratio of cases reported per death for the various diseases suggests that the reporting is fairly complete for diphtheria, measles, and whooping cough, but is considerably below the standard for scarlet fever and typhoid fever. A total of three cases of pulmonary tuberculosis is recorded for each death. Negative stool cultures are required before the release of typhoid patients and two negative throat cultures are required before the release of diphtheria patients. A minimum period of isolation of 30 days is required in cases of scarlet fever. Reported cases are filed by card, and spot maps and chronological charts of cases are utilized. It is stated that 50 per cent of the cases of typhoid fever are hospitalized; 5 to 10 per cent of the cases of diphtheria; and 5 per cent of the cases of scarlet fever. Compulsory vaccination of school children is not required, and 35 to 50 per cent of the school children have been vaccinated—a relatively low figure. Sixteen hospital beds per 100,000 population are available for communicable disease cases.

Tuberculosis.—A total of 241 cases of tuberculosis, all forms, was reported in 1923, with 80 deaths from pulmonary tuberculosis and 22 from other forms of this disease. The probable number of existing cases was said to be from 1,500 to 1,700. The control of this disease is divided between the divisions of communicable disease and public-health nursing. A tuberculosis clinic, a fresh-air camp, and open-window rooms are provided by the health department. Although there is an antispitting ordinance it is not enforced,

and there are apparently no provisions for compulsory segregation. A total of 189 cases from the city was admitted to sanatoria for advanced cases during the year. A maximum of 200 beds in city and county institutions is available for tuberculosis patients.

Venereal disease.—The State law requires notification of cases of venereal diseases by name and address to the health department and to the State department. A detention home is provided for isolation of women when necessary. In 1923, 700 were thus confined. A regulation providing for the automatic quarantine of every woman upon arrest for violation of the moral code is enforced.

Laboratory service is available. A total of 916 cases of syphilis, 892 cases of gonorrhea, and 191 others were treated at the venereal-disease clinic of the health department during the year. No special provision is made for the hospitalization of cases suffering with these diseases, other than at the detention home.

Child hygiene.—This work is organized under the divisions of public-health nursing and communicable disease and includes 2 prenatal clinics, 7 infant and preschool clinics (14 in summer), in addition to school clinics held every day at 36 schools. A dental clinic is conducted by the board of education under the supervision of a full-time dentist. Of the 5,133 live births in 1923, 667 or 13 per cent were reported by midwives, who are only nominally supervised by nurses. The school health supervision carried on by the health department includes complete medical examination, including heart and lungs of children of kindergarten and the first three grades, with follow-up inspection of all children by nurses and teachers. A total of 6,268 children was examined in 1923 while 11,443 physical defects received attention, including 9,073 teeth defects corrected, and 886 tonsil operations. Examination of children applying for work is conducted by a physician employed by the board of education.

Public-health nursing.—A separate division of public-health nursing, with central supervision under a director of public-health nursing, is organized in the health department. Public-health nursing of the health department is generalized, except for tuberculosis and venereal-disease work. The work of private agencies consists of industrial and insurance nursing. A total of 37 public-health nurses was employed by the health department and 2 by private agencies, giving a ratio of 18.7 per 100,000 population.

Industrial hygiene.—The large industrial plants maintain medical, nursing, and dental staffs for this work, but no official work is done except to receive reports of cases and forward them to the State.

Laboratory.—Public-health laboratory service is provided and covers the usual types of examinations, 106 diagnostic examinations per 1,000 population having been performed in 1923.

Food.—The milk supply of Akron is obtained from 3,000 producing dairies inspected and scored periodically by health department inspectors, a total of 3,199 inspections having been made during the year. Ninety-eight per cent of the supply is Pasteurized and the remainder comes from tuberculin-tested herds. Pasteurization plants are inspected regularly, two or three times a week when occasion warrants. Food inspection is regularly carried on and licenses are issued for meat, bakery, and ice-cream concerns as well as for milk plants. All food establishments are scored. Only those food handlers suspected of having communicable diseases are physically examined.

Public utilities.—The public water supply is obtained from surface sources and is treated by coagulation, sedimentation, mechanical filtration, and chlori-

nation, 90 per cent of the population being served by this supply. A large number of wells serve the remaining 10 per cent of the population residing in outlying districts of the city. Both separate and combined systems of sewerage are employed. Treatment of one-third of the sewage is by Imhoff tanks and sprinkling filters, with disposal of the effluent into the Cuyahoga River. Nine per cent of the population used other surface closets or septic tanks. The four scavengers are licensed by the health department.

Sanitation.—General sanitary inspection includes primarily nuisance suppression as a result of complaints. Complete records of all inspections are maintained. A housing code is employed and inspection of occupied dwellings is carried on by the general sanitation staff. Disposal of garbage and refuse is handled by the department of public service. Legal provisions exist for the control of the fly problem by requiring fly-proof manure bins and prompt removal of contents. No measures are directed against mosquitoes and rodents as those are not considered local problems.

Public-health education.—Health education and publicity are carried on under the immediate supervision of the director of health who utilizes the daily press and exhibits and gives lectures to various civic groups.

Special comment.—Progress has apparently been made since 1920 in securing full-time directors for several divisions. The antituberculosis work seems to be well organized, as is that of child hygiene. Since 1923 an extensive vaccination program against smallpox, and an immunization program against diphtheria have been conducted. Beds available for communicable-disease hospitalization are still about half what they should be, and added facilities are needed for venereal disease cases.

ALBANY, N. Y.

The population of Albany was 117,373, classified as 92.8 per cent native white, 5.7 per cent foreign born, and 1.5 per cent colored. The population per square mile was 6,528. The total taxable valuation amounted to \$1,126 per capita.

Administration.—A mayor and council govern the city. The director of public safety has jurisdiction over the bureau of health, there being no advisory council or board of health. The health officer is appointed on a part-time basis at a salary of \$3,500 a year for a two-year period.

Expenditures.—The 1924 appropriations for the health department amounted to \$0.70 per capita, including \$0.26 for garbage disposal, \$0.02 for hospitals, \$0.04 for medical poor relief, and \$0.04 for plumbing inspection. In 1920, \$0.51 per capita were spent by the health department, \$0.45 for health purposes proper.

Vital statistics.—An independent bureau of vital statistics is maintained under the State registrar, returns being made to the State department. It is believed that 99 per cent of the births and 100 per cent of the deaths are reported.

Communicable-disease control.—Reporting of communicable disease cases is reasonably complete, as judged by the ratio of cases reported for each annual death. Measures for the control of communicable diseases correspond in general with accepted standards, although cases of typhoid are released without first securing negative cultures from stools and urine.¹ All the school children are reported to have been vaccinated against smallpox. Twenty-five per cent of the cases of typhoid, 35 per cent of the cases of diphtheria, 30 per cent of the cases of scarlet fever, and all the cases of smallpox are hospitalized.

¹ At present (1925) no typhoid fever patients are discharged without two negative stools and urine examinations having been secured.

Tuberculosis.—Two hundred and fifty cases with 129 deaths from this disease were reported. Clinic facilities are maintained at the Albany Hospital and at the South End Dispensary. Nurses' visits in behalf of tuberculosis cases numbered 2,766, 1,563 of these visits having been made by health department nurses and 1,203 by the public-health nurse employed by the Albany Guild. There were 488 clinic patients who made approximately 1,000 clinic visits during the year, while 70 patients were admitted to the municipal tuberculosis hospital.

Venereal disease.—There were 724 cases of syphilis and 446 cases of gonorrhea reported by name and address to the local and State health departments. Clinic facilities are provided at three different hospitals and at the South End Dispensary where 368 cases of syphilis and 214 cases of gonorrhea received treatment during the year.

Child hygiene.—There were 133 prenatal cases who paid 305 visits to clinics, while 2,021 nurses' visits were made in behalf of prenatal cases. Of 2,307 live births, 1,352 occurred in hospitals and 196 were attended by midwives supervised in accordance with State law. There were 1,155 children under 6 years of age who paid a total of 3,930 visits to clinics, while 5,123 nurses' visits were made to homes in behalf of these children. Health supervision of children of the public schools is carried on by the board of education. A complete physical examination is given children of the first and fifth grades each year, a total of 2,286 examinations having been made in 1923. Children applying for working papers are first required to pass a physical examination given by the health officer. There are no organized activities locally for the special control of mental cases.

Industrial hygiene.—Industrial hygiene work is carried on by the State department of labor.

Public-health nursing.—There are 3 public health nurses employed by the health department, 10 by the board of education, and 14 by the Albany Guild, giving a ratio of 21.8 nurses per 100,000 population.

Laboratory.—Public-health laboratory service is provided on the contract basis, 44,096 examinations of all kinds having been made during the year.

Food and sanitation.—An effort is made to inspect dairies producing milk for the city once a year. Tuberculin testing of all herds from which milk is sold raw is required. Sixty-five per cent of the milk supply is Pasteurized. The per capita consumption of milk amounts to 0.4 pint daily, which is less than half the minimum standard suggested as desirable by nutrition experts.² One meat market inspector is employed. Sanitary inspections are made chiefly as the result of citizens' complaints for the abatement of nuisances. The disposal of garbage and refuse is carried on under the supervision of the health department, the method being by disposal to hogs.

Public utilities.—The public water supply owned by the city is derived from the Hudson River and is treated by sedimentation, coagulation, filtration, and chlorination. Laboratory analyses of the 10 cubic centimeter samples of treated water showed *B. coli* present in 1.54 per cent of the samples. The combined system of sewerage is employed by 98 per cent of the population, treatment being by Imhoff tanks before the discharge of the effluent into the Hudson River.

Public-health education.—The health officer publishes an annual report as a part of the report of the director of public safety. The press is utilized to a limited extent.

² Since May 1, 1924, all milk sold, except Grade A raw and certified, is Pasteurized. Milk consumption is now (1925) approximately 1 pint per person daily.

Special comment.—There is need for early discovery and reporting of cases of tuberculosis together with increased facilities for hospitalization of cases. Increased responsibility should be assumed by the municipality in the further development of a child-hygiene program which will give greater consideration to the problems of the preschool child and provide health supervision for children of the parochial schools at least on a par with that given children of the public schools.³ Stimulus should be given to securing increased Pasteurization of the milk supply and increased milk consumption to reach at least 1 pint per person per day.

ALLENTOWN, PA.

The population of Allentown was 87,329, classified as 89.4 per cent native white, 10.4 per cent foreign born, and 0.2 per cent colored. The city occupies an area of 10 square miles, giving a population per square mile of 8,733. The taxable valuation was \$831 per capita.

Administration.—The city is governed by a mayor and four commissioners, known as city council. City council constitutes the board of health, and they consider the recommendations of the health officer and authorize regulations and appropriations thus recommended. The health officer is appointed on a full-time basis by the commission council for an indefinite term at a salary of \$2,400.

Expenditures.—The total expenditures by the health department in 1923 amounted to \$0.57 per capita, \$0.24 of which were for health services, while \$0.26 were spent for the collection and disposal of garbage and refuse, and \$0.07 for comfort stations.

Vital statistics.—Registration of vital statistics is conducted by the secretary of the board of health, who is local registrar for the State department of health. Checks for completeness of birth and death reports are regularly made, and reports are published annually.

Communicable-disease control.—Reporting of communicable diseases is commendable, the medical fraternity being eager to cooperate with the board of health, while the latter renders all possible assistance to practitioners. In general, measures for communicable-disease control are modern, although measles cases are isolated for a period of 16 days, which seems longer than experience indicates as necessary. Gaseous fumigation is still practiced after cases of smallpox and tuberculosis. Facilities for hospitalization of cases of diphtheria and scarlet fever seem to be quite inadequate, and this is borne out by the fact that no cases of diphtheria and only 10 per cent of the cases of scarlet fever are thus cared for.

Tuberculosis.—The fact that only 68 cases of tuberculosis were reported to the health department, while there were 74 deaths, is a clear indication of incompleteness of reporting of this disease. There should be from 4 to 5 cases reported for each annual death according to present standards. Two clinics are maintained in city hospitals through cooperation with the State department of health.

Venereal disease.—Reporting of cases of venereal disease is not required except in cases which do not continue necessary treatment. There are two State clinics maintained at city hospitals, and 10,621 visits were made to

³ In 1924, four nurses were added to the bureau of health to do school work in the parochial and private schools. All children of the parochial schools have been vaccinated against smallpox. A campaign for toxin-antitoxin immunization against diphtheria is being conducted in 1925.

these clinics during the year. Two part-time nurses are maintained for clinic and home follow-up work.

Child hygiene.—A division of child welfare is organized in the bureau of health, although school health supervision is exercised by the board of education. Of the 1,939 live births, 280 occurred in hospitals and 300 were attended by midwives, who are registered by the State and supervised by the State inspector of midwifery who is a physician. There are 4 infant-welfare clinics with 835 children under 2 years of age registered as having made 1,465 visits, while 2,423 nurse's visits were made to homes. An attempt is made to examine children of all grades of the public schools once a year, but there is no special provision made for children of the parochial schools. There were 13,000 examinations made in 1923 and 3,554 defects discovered, but the records of the defects corrected are incomplete. Children applying for working papers must pass a general physical examination before receiving a certificate. A State mental clinic has recently been established, but there are no special municipal activities.

Industrial hygiene.—This work is confined to activities of individual plants.

Public-health nursing.—Three nurses were provided by the health department, 5 by the board of education, and 4 by the State, giving a ratio of 13.8 nurses per 100,000 population.

Laboratory.—A public-health laboratory is maintained in which 33 diagnostic specimens per 1,000 population were made during the year, in addition to 577 examinations of milk and 1,178 analyses of water.

Food and sanitation.—Dairies producing milk for the city are inspected but not scored, 250 inspections having been made. There are regular provisions concerning tuberculin testing of cattle where milk is offered for sale raw and where inspection reveals animals that may be suspected of having tuberculosis. A city ordinance provides for the use of the holding method for Pasteurization and automatic recording thermometers are also required, 98.5 per cent of the supply being Pasteurized. The total per capita consumption amounted to 0.6 pint per day, which is 0.4 of a pint less than the desired standard. Supervision is maintained over slaughtering places, meat markets, and food establishments. General sanitary inspections are made for the prevention of nuisances, and the inspectors also assist in the placarding of homes in which communicable-disease cases exist.

Public utilities.—The public water supply owned by the city is treated by chlorination before being served to all the people. It was stated that no *B. coli* were found in 10 cubic centimeter samples of treated water. A separate sewerage system accommodated only 9 per cent of the population, while an additional 15 per cent were connected to storm sewers. It is estimated that 15,000 privy vaults and cesspools were in use, special regulations existing for the prevention of nuisances. Permits are required for the installation and cleaning of cesspools, while scavengers are licensed by the board of health.

Public health education.—The health officer utilizes the daily press, delivers about 100 lectures a year, and conducts a general course of lectures for nurses.

Special comment.—There is need for increased appropriation for the health department in order that preventive health measures may be extended and that an adequate salary may be provided for the health officer. Measures for the control of communicable diseases should conform to accepted standards, and gaseous fumigation should be abandoned. Increased facilities should be provided for diagnosis and treatment of tuberculosis, together with additional nursing follow-up service. Reporting of cases of venereal disease should be required, and records should be available in the city department of health. The

program for care of expectant mothers and for children of preschool age should be extended. Provision should also be made for health supervision of children of the parochial schools, while increased efforts should be directed to the correction of defects found among all school children examined.

ATLANTA, GA.

Atlanta is a city of 222,963 people of which 64.8 per cent were native white, 4 per cent foreign born, 31.2 per cent colored. The city occupies an area of 31.6 square miles, giving a population per square mile of 7,056. The total taxable valuation was \$1,314 per capita.

Administration.—The city is governed by a mayor, a board of aldermen, and a city council. The health department is one of the two departments under the direction of a sanitary committee of the city council. There is no advisory council nor board of health. The health officer is appointed by the sanitary committee of the council on a full-time basis for a term of two years at a salary of \$3,300. The appointment and dismissal of subordinates, the making of rules and regulations, the hearing of appeals from orders, and the promulgation of special emergency regulations rest with the sanitary committee, while the issuing of orders and the abatement of insanitary conditions are duties of the health officer, salaries being fixed by the financial committee of the city council.

Expenditures.—The total expenditures of the health department in 1923 amounted to \$0.44 per capita of which \$0.06 were for hospitals, \$0.04 for plumbing inspection, and \$0.02 for medical poor relief. In 1920 the expenditures of the department amounted to \$0.40 per capita, of which \$0.34 were for health services, the remainder for hospitals.

Vital statistics.—The collection of vital statistics is a function of the city registrar, certificates of birth and death being regularly checked for completeness and accuracy. It is probable that 85 per cent of the births and 100 per cent of the deaths are reported. There are no reports issued locally.

Communicable-disease control.—Reporting of cases of typhoid, diphtheria, and measles is apparently quite incomplete as judged by the fact that an average of only 1.7 cases of typhoid for each death, 8.3 cases of diphtheria for each death, and 20 cases of measles for each death are reported, as compared with minimum standards for these diseases of 10, 15, and 100, respectively. Gaseous fumigation is still practiced after cases of diphtheria, scarlet fever, smallpox, cerebrospinal meningitis, and tuberculosis. Ninety-five per cent of the school children have been vaccinated.

Tuberculosis.—There were 582 cases with 235 deaths reported. There is one clinic maintained by voluntary agencies where 6,017 patients were on active records during the past year, while 9,173 visits by nurses were made in behalf of tuberculosis cases. Two hundred beds are available for city and county cases at the city and county sanatorium and 332 patients were admitted.

Venereal diseases.—Reporting in accordance with State law is by office number to the local health department, 208 cases of syphilis, 816 cases of gonorrhea, and 52 other cases having been reported. Clinic facilities are provided separately for white and colored at the Grady Hospital, but no hospital facilities are available for bed cases.

Child hygiene.—Of 5,171 live births, 11 per cent were attended by midwives, who are registered by the city. Sixteen clinics are maintained in the local schools where 2,922 children under two years were registered, while 8,000 nursing visits were made to homes in behalf of children of these age groups.

Health supervision of children of the public schools is carried on by the health department. A physical examination which is not sufficiently complete, however, to include heart and lungs is made of children of the elementary grades and the junior high school once a year. There were 20,012 examinations made and 16,117 defects discovered, but information as to the number of defects corrected is not available. No special examination is required of children applying for working papers. There is no organized activity for the promotion of mental health.

Industrial hygiene.—The only industrial hygiene work carried on in Atlanta is that of individual concerns.

Public-health nursing.—The health department provided 16 nurses, the tuberculosis association 7 nurses, and voluntary agencies 12 nurses, giving a ratio of 15.7 nurses per 100,000 population.

Laboratory.—A public-health laboratory is maintained for the examination of water, milk, and for general diagnostic work. A total of 17 diagnostic specimens per 1,000 population was made during the year.

Food.—The 440 dairies producing milk for the city are inspected and scored, and 2,411 inspections have been made. All herds producing milk for the city are tuberculin tested once a year by State and Federal veterinarians. The eight local milk plants are supervised by inspection and laboratory analysis, while 25 per cent of the supply was Pasteurized. The per capita daily consumption amounted to 0.9 pint. General inspections are made of stores, eating places, soda fountains, and bakeries by four district inspectors.

Sanitation.—General sanitary inspections are made chiefly as a result of complaints for the abatement of nuisances. Plumbing inspection is carried on by the health department.

Public utilities.—The public water supply owned by the city is derived from the Chattahoochee River and is treated by coagulation, filtration, and chlorination before being served to all the population. Laboratory analyses of treated water showed no *B. coli* present in 10 cubic centimeters samples. Both the combined and separate types of sewerage systems are employed. Eighty per cent of the population is accommodated. Treatment is by the use of grit chambers, Imhoff tanks, and trickling filters before discharge of the effluent into streams.

Public health education.—The health officer occasionally utilizes the daily press and delivers lectures before women's clubs and civic organizations on general health topics.

Special comment.—Since 1920 there has apparently been a decided increase in milk consumption in the city of Atlanta, as the present per capita consumption is only 10 per cent below the minimum standard as compared with 72 per cent below in 1920. The standards of the American Public Health Association for the control of communicable diseases should be adopted. An increased number of hospital beds for communicable-disease cases is also needed.⁴ The program of health supervision of school children should be extended to children of the parochial schools and should be sufficiently complete to include a complete physical examination, including heart and lungs, at least three times during school life. Pasteurization of milk should be required. There is urgent need for the development of a comprehensive program for the protection of maternity and infancy and preschool age children.

⁴ Since 1923 the school dental program has been extended, as has prenatal nursing. An addition has been made to the contagious-disease hospital providing 60 more beds to be used for venereal-disease cases, and also for psychopathic cases when necessary.

BALTIMORE, MD.

Baltimore is a city of 773,580 people, classified as 74.4 per cent native white, 10.8 per cent foreign born, and 14.8 per cent colored. The city occupies an area of 91.9 square miles, the land area amounting to 78.7 square miles. The total taxable valuation amounted to \$1,600 per capita.

Administration.—A mayor and council govern the city. There is no advisory council, nor board of health. The commissioner of health is appointed by the mayor for a term of four years on a full-time basis at a salary of \$5,000 (\$6,000 in 1924). He has broad administrative powers.

Expenditures.—The health department expenditures in 1923 amounted to \$0.78 per capita, of which \$0.06 were for hospitals. Expenditures in 1920 amounted to \$0.60 per capita of which \$0.53 were for health purposes proper.

Vital statistics.—Registration of vital statistics is conducted by the health department. Modern procedures are followed and checks of certificates indicate that from 95 to 98 per cent of the births are reported and 100 per cent of the deaths. Classified tabulations are made and reports are published monthly and annually.

Communicable-disease control.—Reporting of communicable diseases is reasonably complete. Case records of diseases are filed chronologically by diseases, and spot maps are utilized. There is an average of 21.3 hospital beds for communicable-disease cases per 100,000 population. Diphtheria immunization has been undertaken; and practically all the school children have been vaccinated against smallpox. Gaseous disinfection is still practiced after cases of tuberculosis, diphtheria, scarlet fever, and smallpox.

Tuberculosis.—A total of 1,536 cases with 989 deaths was reported. There are 6 health department clinics with 5,538 patients on the active records, while 32,842 visits were made by nurses in behalf of tuberculosis cases during the year. A total of 958 hospital beds is available in city and State institutions for tuberculosis patients.

Venereal diseases.—There were 1,295 cases of syphilis, 1,849 cases of gonorrhea, and 211 other cases reported. In the two municipal dispensary clinics 3,979 patients were diagnosed for gonorrhea, and 6,273 patients for syphilis, and treatment registered. There are two social service workers (one white and one colored), who made 1,681 visits.

Child hygiene.—The registration of expectant mothers numbered 588, prenatal service being provided by the health department. Midwives are examined by the State board of health, although only limited supervision is exercised over their activities. Of 17,880 live births, 22 per cent were attended by midwives. Nursing visits in behalf of infants under 2 years numbered 96,243, while 1,822 children under 2 years of age and 721 children of ages 2 to 5, inclusive, visited clinics. A division of school hygiene is organized in the health department for the benefit of children of the public and parochial schools. A physical examination is given children of the first to the sixth grades, inclusive, and all children of the senior high school once a year. There were made during the year 116,958 examinations, and 78,848 of the children were found to have defects, while the defects corrected numbered 22,252. Children applying for working papers are required to pass a physical examination before being issued a certificate.

Mental hygiene.—Clinic facilities for diagnosis are provided at the Phipps Dispensary by the Mental Hygiene Society. A psychiatrist is employed by the health department for work in the schools.

Industrial hygiene.—Industrial hygiene activities are limited to the work of industrial concerns.

Public-health nursing.—A bureau of nursing is organized in the health department. There were 131 nurses employed by the health department, 24 by the visiting nurses' association, and 27 by the babies' milk fund, giving a ratio of 23.5 nurses per 100,000 population.

Laboratory.—A public-health laboratory is maintained where 85 diagnostic examinations per 1,000 population were made during the year, in addition to other examinations made in the laboratory of the bureau of chemistry and food. Special researches of diphtheria carriers and milk bacteriological problems are carried on.

Food.—Under the bureau of chemistry and food there were made 6,260 inspections of producing dairies during the year. Tuberculin testing of all herds is required and is made by Federal and State veterinarians, and 98.2 per cent of the milk supply was Pasteurized. The per capita milk consumption amounted to 0.6 pint daily, which is 0.4 pint less than the minimum standard usually recommended. Inspections are made of foodstuffs and premises, as well as the methods of handling food.

Sanitation.—General sanitary inspections are made for the abatement of nuisances. Special activities include the investigation of ventilation and sanitary conditions in printing establishments. Special measures are directed against fly and mosquito breeding.

Public utilities.—The public water supply owned by the city is derived from the Gunpowder River and is stored, filtered, and chlorinated before being served to 97 per cent of the population. Laboratory analyses of 1 cubic centimeters samples of treated water show *B. coli* present in 0.03 per cent of the samples. The separate system of sewerage is employed and serves 75.5 per cent of the population. The sewage is treated by screening, sedimentation, and filtration on trickling filters before being discharged into the river.

Public-health education.—The commissioner of health publishes an annual report of 500 copies, and monthly bulletins of 5,000 copies. The daily press is utilized weekly or oftener for special notes concerning important diseases and other health matters. Lectures are given occasionally by the commissioner of health and bureau heads.

Special comment.—Progress has been made since 1920 in extending the program of maternal, infant, and child hygiene. Special studies have been made of health hazards in industrial plants. Increased facilities are needed for the control of tuberculosis. Consideration might well be given to the organizing of a special division or bureau of health education as a major activity of the department.

BAYONNE, N. J.

Bayonne is an industrial community of 84,398 population, 64.2 per cent native white, 33.2 per cent foreign born, and 2.6 per cent colored. The city covers an area of 3.7 square miles, giving a population per square mile of 22,810. The taxable valuation was \$1,808 per capita.

Administration.—The city is governed by a mayor and board of five commissioners. These commissioners, elected for terms of four years, together with the health officer ex officio, serve in the capacity of a board of health, passing upon proposed health regulations, making appointments, and exercising general supervision over the health department. The health officer is appointed by the board, on a part-time basis, at a salary of \$2,350, to serve for a period of three years under civil service. Appointment and dismissal of subordinates

rests with the board, who also pass upon salaries and rules and regulations recommended by the health officer. All appointments, except the health officer, are probational for five years and are made annually for all employees during this time. After that time public trial is necessary for removal.

Expenditures.—The per capita expenditure in 1923 by the health department, all for health purposes, was \$0.27, which was one of the lowest in the cities studied.

Vital statistics.—Registration of vital statistics is under the Hudson County Board of Health, which receives reports of births and deaths and issues monthly reports. Deaths are classified only by age and sex.

Communicable-disease control.—Case records are kept in a daybook unclassified. That reporting is quite incomplete is shown by the ratio of cases to deaths, which is in the case of typhoid 2.5 to 1, of diphtheria 12, of scarlet fever 63, of whooping cough 2.5, and of measles 12 cases, with no deaths. Gaseous fumigation is still employed after diphtheria, scarlet fever, smallpox, cerebrospinal meningitis, acute anterior poliomyelitis, influenza, pneumonia, and tuberculosis. The period of isolation in cases of typhoid is 75 days and of diphtheria 21 days, with release based on the attending physician's card at the end of these periods, except in diphtheria, when cultures are secured if "thought necessary." Hospitalization is provided in the Hudson County Hospital, but only 5 per cent of the diphtheria cases and 2 per cent of the scarlet-fever cases are thus cared for.

Tuberculosis.—A total of 140 cases with 50 deaths was reported in 1923. Antituberculosis work is under the Hudson County board of freeholders, with cooperation from the county tuberculosis clinic. During 1922, 373 patients were admitted to hospitals or sanatoria, there being 175 beds available for this purpose in the county hospital. A total of 2,547 nursing visits was made in behalf of tuberculosis cases by the three county nurses.

Venereal diseases.—Under the State law, cases are reported by name and address to the State health department (60 in 1923), report being made to the local department only by request of the attending physician. Clinic facilities are provided at the dispensary of the city hospital, where 49 cases of syphilis and 11 of gonorrhea were treated during the year, a total of 20 cases of venereal diseases having been hospitalized locally. No routine examination is made of sex offenders.

Child hygiene.—Prenatal care and infant and preschool hygiene activities are carried on by a bureau of child hygiene which is distinct from the health department but cooperates with it. Three nurses, full time, 4 physicians, 1 dentist, 1 orthopedist, and 1 masseuse, each part time, are employed. Expectant mothers registered at clinics numbered 41, representing less than 2 per cent of the total births. Of the 2,195 live births, 48 per cent were attended by midwives whose technique and equipment are regularly inspected by a State supervising nurse. Six per cent of the births occurred in hospitals. Three infant-welfare clinics, located at the hospital and at two schools, registered 110 new babies. A total of 6,003 visits was made to infant and preschool clinics, while 2,547 home visits were made by the nurses. School health supervision of the 15,074 pupils enrolled in 16 public schools is handled by a staff of 4 part-time physicians, 8 nurses, 2 part-time dentists, and 2 oculists, employed by the board of education. The cost per pupil for this work amounts to \$1.48. Effort is made to give a complete physical examination annually to children in all grades, including kindergarten, in addition to monthly inspections by nurses. As a result of the examination of 7,202, there were found 7,903 defects, of which

51 per cent were corrected. Fresh-air classes are provided for undernourished children and special classes for backward children. A complete examination by a school physician is required of children applying for working papers. The board of education maintains a special school with a staff of 7 teachers for mental cases referred by teachers of the public schools.

Industrial hygiene.—This work is confined to State activities and to the medical and nursing services rendered employees by a few of the local industries.

Public-health nursing.—One nurse was provided by the health department, 8 by the school board, and 6 by other agencies, including the county tuberculosis commission. This gives a ratio of 16.6 nurses per 100,000 population.

Laboratory.—There is no local laboratory service provided by official agencies.

Food and sanitation.—Inspection of dairies and tuberculin testing are handled by the State board of health. It is stated that 9.6 per cent of the milk supply was Pasteurized. The per capita daily milk consumption was 1 pint. Only chemical laboratory examinations are made and these are performed in the county laboratory. Inspections are regularly made of local milk plants and food stores, drug stores, and restaurants, and permits are issued to poultry markets and milk dealers. Sanitary inspection includes dwelling houses, plumbing, and the follow up of complaints for the abatement of nuisances. Bathing in waters adjacent to the city is forbidden, except at the county park, because of the high degree of pollution.

Public utilities.—All the people were served by the public water supply, which is privately owned and derived from the Passaic watershed. Treatment consists of sedimentation, filtration, and chlorination. The entire population is served by the combined sewerage system, the raw sewage being discharged into the bay.

Special comment.—One of the outstanding needs is for an increased budget to allow sufficient salary to warrant a full-time health officer service, in addition to increased personnel for the various divisions of the health department. Standard procedures should be adopted for the control of acute communicable diseases, and gaseous fumigation following cases of communicable disease should be abandoned. Effort should be made to secure better reporting and increased treatment of cases of venereal disease. Arrangement should be made for closer supervision of the milk supply, including bacteriological analyses.

BIRMINGHAM, ALA.

The population of Birmingham was 195,901, classified as 57.2 per cent native white, 3.5 per cent foreign born, and 39.3 per cent colored. An area of 52 square miles is occupied by the city, giving a population per square mile of 3,767. The taxable valuation was \$744 per capita.

Administration.—The city is governed by a commission. A board of health of 6 members, 5 of whom must be physicians, is elected by the county medical society for a term of five years. The president of the county board of revenue is ex officio member of the county board of health. The health officer is also county health officer, appointed by the board of health subject to the approval of the State board of health, on a full-time basis at a salary of \$5,000 (\$6,500 in 1925), paid by the county. The term of service is for not less than three years, but the position is not under civil service. There are eight principal divisions of the department.

Expenditures.—The expenditure of the health department in 1923 amounted to \$0.37 per capita, all of which was for health purposes. In 1920, \$0.47 per capita were devoted to health service.⁵

Vital statistics.—Registration of vital statistics is conducted by the health department, the International List of Causes of Death being used. Birth and death certificates are checked for completeness and accuracy, and it is estimated that 96 per cent of the births and 99 per cent of the deaths are reported.

Communicable-disease control.—Reporting of the principal communicable diseases is fairly complete, but there are no provisions for hospitalization of cases other than typhoid fever and smallpox. Except for the release without securing negative cultures of convalescent typhoid cases, measures for the control of communicable diseases correspond in general with accepted standards.⁶

Tuberculosis.—There were 256 cases, with 536 deaths, reported. Clinic facilities are provided by voluntary agencies, there being 120 clinic patients registered at clinic, while 3,218 nursing visits were made to homes. At the county sanatorium 35 beds are available for adult cases, 79 patients having been admitted.

Venereal diseases.—Reporting in accordance with State law is by office number to the health department. A total of 2,035 cases of syphilis and 667 cases of gonorrhea was reported, while 6,925 patients were registered at the clinic as having made 27,748 visits. This clinic is operated daily by the health department. One nurse attends clinic, there being no follow-up work. Notices are mailed to those failing to return for treatment, and if no response results cases are referred to the quarantine officer for action.

Child hygiene.—There were 898 expectant mothers registered as having made 1,537 visits to the prenatal clinic of the health department, while 2,367 home visits were made in behalf of prenatal cases. Of 4,726 live births, 31 per cent occurred in hospitals and only 0.5 per cent were attended by midwives. There are 1,179 preschool children registered at clinics as having made 2,621 visits, while 16,470 nursing visits were made to homes of babies under 1 year of age, and 1,941 visits to preschool children. Health supervision of children of the public schools is performed by the board of education which maintains a staff of 2 part-time physicians, 3 nurses (1 colored), and 1 special teacher for home visitation. A physical examination, not including heart and lungs, is made of all pupils at the beginning of each term. There were 28,101 such inspections made but records of defects found and corrected are apparently incomplete. Although a physical examination is required of children applying for working papers this examination need not be made by a physician. There is no special activity for the promotion of mental health. The State law places school medical work under the board of health, but this plan has not yet been accepted by the city board of education, although all medical work in the county schools has for several years been conducted by the board of health.

Industrial hygiene.—The only industrial hygiene work is that done by individual concerns.

Public-health nursing.—Public-health nursing in the health department is organized as a division of child hygiene and public-health nursing, with 14 nurses, including a nurse as director. In addition, 3 nurses are supplied by

⁵ Budget for 1925 was \$101,000 and for 1926 is \$125,000, all of which is for health purposes.

⁶ Release cultures for typhoid convalescent cases will be required after Jan. 1, 1926.

the board of education and 2 by nonofficial agencies, giving a ratio of 9.7 nurses per 100,000 population.

Laboratory.—A well-equipped laboratory renders the usual free diagnostic, bacteriological, and chemical service for the city and county, a total of 65,858 examinations having been made.

Food.—Systematic supervision of the milk supply is exercised from the source to the time of delivery. Dairies are inspected and scored monthly. Tuberculin testing of all herds from which milk is to be sold either raw or Pasteurized is required, and approximately 100 per cent of all herds have been tested. Three members of the county medical society serve as a medical milk commission. Three plants (1925, five plants), in which 73 per cent of the supply was Pasteurized, are inspected daily, while laboratory supervision is also maintained. The total per capita consumption was one-third of the desired standard of 1 pint per capita per day (0.6 pint in 1925). Inspections are regularly made of food-handling establishments.

Sanitation.—General sanitary inspections are made, chiefly as a result of complaints. No special measures are directed against fly and mosquito breeding. Recent ordinances make it possible to proceed against flies and mosquitoes.

Public utilities.—The public water supply, privately owned, is derived from surface sources and is treated by mechanical filtration and chlorination before being served to 90 per cent of the population. The separate system of sewerage is employed and accommodated 80 per cent of the population. The sewage is treated by passage through septic tanks and contact beds before discharge into the river.

Public-health education.—There is no organized activity in public-health education. The health officer utilizes the daily press and exhibits and delivers frequent lectures on general health topics before civic organizations.

Special comment.—Progress has been made since 1920 in securing more complete reporting of the principal communicable disease and in milk supervision. There should be an increased appropriation to provide for additional staff for communicable-disease control work and for additional public-health nursing activities. Additional hospital beds are needed for communicable-disease cases, including diphtheria and scarlet fever, as well as tuberculosis and the venereal diseases. The school health program should be extended to include children of the parochial schools and to provide for a complete physical examination, including heart and lungs, of all children, at least three times during school life. A continuous record of defects found and corrected should be kept for each child.

BOSTON, MASS.

Boston is a city of 770,400 people, of whom 65 per cent are native white, 31.9 per cent foreign born, and 2.2 per cent colored. The city occupies an area of 47.8 square miles, giving a population per square mile of 16,117. The taxable valuation amounted to \$2,225 per capita.

Administration.—The city is governed by a mayor and a city council of nine members. There is an advisory council of nine members appointed by the mayor for a term of four years. The appointment of the commissioner of health is by the mayor with confirmation by the State civil-service department. The term of office is four years and the salary is \$7,500.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.66 per capita, of which \$0.59 was for health purposes, \$0.02 per capita for the detention hospital, and \$0.05 for comfort stations. In 1920 the expendi-

tures of health department and expenditures for health purposes proper amounted to \$0.55 and \$0.48 per capita, respectively.

Vital statistics.—Registration of vital statistics is conducted according to modern standards. Certificates of births and deaths are checked and verified for completeness and accuracy, and tabulations are made weekly, monthly, and annually. Tabulations are made according to nativity, sex, age, and cause. Reports are issued weekly, monthly, and yearly.

Communicable-disease control.—Measures for the control of communicable disease are, in general, in accord with the standards of the American Public Health Association. Reporting of the principal communicable diseases is quite complete, as indicated by the fact that 12 cases per death of typhoid, 19 of diphtheria, 54 of scarlet fever, and 88 of measles were reported to the health department. While not enforced invariably, release of cases of typhoid fever from isolation are usually based upon negative findings in three cultures of stool and urine samples. The number of visits by members of the health department staff to cases of diphtheria, typhoid, scarlet fever, measles, and whooping cough averages 4.9. There are 73.7 hospital beds per 100,000 population provided for communicable-disease cases. A very active campaign is being waged against diphtheria, and 52,516 persons were actually immunized during the year. Vaccination against smallpox is compulsory for admission to school, and 99 per cent of the school children of the first grade have been protected.

Tuberculosis.—A total of 2,021 cases with 791 deaths was reported. There are 28 hospital clinics where diagnostic facilities are available, in addition to the three clinics, not operated by the health department, for diagnosis and treatment of tuberculosis. A total of 7,411 clinic patients was on active records as having been seen during the year, while at least 8,126 visits were made to clinics. A total of 500 beds is available for adults and 325 beds for children in city, county, and State institutions, and 563 Boston sanatorium patients were admitted during the year. Visits by nurses in behalf of tuberculosis cases number 66,396.

Venereal diseases.—Reporting according to State law is by number to the State department of health, a total of 837 cases of syphilis and 2,310 cases of gonorrhea having been reported. Only cases which have failed to continue necessary treatment are reported to the local health department. Four special clinics are provided for venereal-disease cases, and 127,034 visits were made for diagnosis and treatment to these clinics during the year. A total of 451 cases was returned to physicians or clinics after having stopped treatment.

Child hygiene.—Infant and preschool care is provided by the health department through the division of child hygiene and health unit No. 1. Prenatal nursing care is given by the community health association. In all, 55,353 visits of expectant mothers were made to clinics, and 13,803 nurses' visits were made in behalf of prenatal cases. Of the 19,020 live births, 50 per cent occurred in hospitals. There is no estimate of the number of births attended by midwives, as they are not licensed, recognized, or supervised in the State. There are 29 infant-welfare stations, only one of them operated by the health department. A total of 14,016 children under 2 years of age paid 62,959 visits to clinics, while 127,187 nurses' visits were made in behalf of children of this age period. Special clinic facilities of preschool age are provided by health unit No. 1 and the community health association, 27,677 nurses' visits having been made in behalf of children aged 2 to 5. There were held 2,175 well-baby conferences. Health supervision of children of the public schools is carried on by the school committee through the department of medical inspection. A complete physical

examination is made annually of children of all grades, including high and normal schools, by physicians assisted by nurses. A total of 113,780 examinations is reported to have been made for the school year ending 1922, and 95 per cent of the teeth defects were corrected, while 29 per cent of the defects of tonsils, 38 per cent adenoids, 42 per cent eyes, and 38 per cent hearing received attention. Special classes are organized for educationally exceptional children, for sight conservation, and for speech improvement. The jurisdiction or supervision of children in industry in Massachusetts is carried on jointly under the State department of labor and industry, the State department of education, the local superintendent of schools, and either the health department or the school committee, depending upon which agency has charge of the medical inspection of school children. A complete examination of children applying for working papers is required to be made by school physicians.

Mental hygiene.—The health department furnishes personnel to assist the State officials in their activities for securing early diagnosis, and one of the State-operated habit clinics for preschool children is housed in the building of health unit No. 1.

Industrial hygiene.—This work is delegated by law to the State board of labor and industry. An industrial disease clinic is operated by the Massachusetts General Hospital, and special provision is made privately by industrial concerns for medical and nursing service.

Public-health nursing.—There were 170 nurses provided by the community health association under a generalized public-health nursing plan, 31 nurses by the health department, 34 by the Boston Sanatorium, 52 by the school committee, and 4 by other agencies, in addition to 45 nurses employed by industrial firms. This gives a ratio of 37.8 nurses per 100,000 population, exclusive of the industrial nurses.

Laboratory.—The usual free bacteriological and chemical laboratory service is provided by the city health department. A total of 71 diagnostic examinations per 1,000 population was made during the year. Special researches include studies of complement fixation in tuberculosis and gonorrhea. Antitoxins and vaccines are distributed.

Food.—Systematic supervision of the milk supply is maintained from the source to the point of delivery. Excellent regulations are in force and require that all raw milk must be from tuberculin-tested and accredited herds. The Pasteurizing plants are closely supervised and 93 per cent of the supply was Pasteurized. The total per capita consumption amounted to 1 pint daily. Inspection is made of all food-handling establishments, and permits are issued by a licensing board for hotels, restaurants, etc., which are approved by the health department. The food division of the health department and the laboratory exercise control over drugs.

Sanitation.—General sanitary inspections are made upon the initiative of the department, as well as for the abatement of nuisances as a result of citizens' complaints. Special activities include mosquito control and the prevention of fly and rat breeding. Regulations governing swimming pools and bathing places have been recently revised by the engineering division of the department of public health.

Public utilities.—The public water supply, owned by the State of Massachusetts and operated by the Metropolitan Water Board, serves all people with water derived from Lake Cochituate, Sudbury Reservoir, and Wachusett Reservoir. There is no treatment except storage. It is reported that none of the 1 cubic centimeter samples and about 10 per cent of the 10 cubic centimeter samples of water showed *B. coli* present. Both combined and

separate systems of sewage are in use and were of service to 90 per cent of the population. Treatment is by sedimentation, the effluent being discharged into Boston Harbor.

Public-health education.—Education and publicity are carried on by the department secretary and the general staff. The daily press is utilized regularly, and monthly bulletins and an annual report are published in addition to health digests and pamphlets. Lectures on general health topics are frequently given to the public and to school groups, motion pictures being used from time to time. Extensive exhibits were prepared and used in connection with the Boston health show.

Special comment.—Considerable progress has been made since 1920 in the development of a coordinated plan for the protection of maternal and infant life through the pooling of voluntary and official nursing activities and the extension of health centers. Improvement in the regulations and supervision of the milk supply is also noted. Provision should be made for the extension of health education by official agencies.

BRIDGEPORT, CONN.

Bridgeport is an industrial city with a population estimated locally to be 158,518, classified as 66.5 per cent native white, 32 per cent foreign born, and 1.5 per cent colored. The city occupies an area of 17.9 square miles, giving a population per square mile of 8,856. The total taxable valuation was \$1,648 per capita.

Administration.—The city is governed by a mayor and common council. There is a board of health of four members appointed by the mayor for a term of two years. The medical health officer is appointed by the board of health on a full-time basis for a term of four years at a salary of \$5,500. Under the health statutes broad powers of administration are given the health officer.

Expenditures.—The total expenditures of the health department in 1923, based on local estimates of population, amounted to \$2.12 per capita, but of this only \$0.62 was set aside for health purposes proper, while \$0.40 was devoted to hospitals and \$1.10 to the collection and disposal of garbage and ashes. This compares with \$2.97 spent by the health department in 1920, \$1.05 of which was for health purposes proper, \$0.44 for hospital service, and \$0.143 for garbage and refuse collection, with \$0.05½ for miscellaneous purposes. During 1923 dental work, formerly under the health department, was carried on by the board of education. It has since 1924 been performed by the health department.

Vital statistics.—Registration of vital statistics is conducted by the department of health. Verification of reporting of births and deaths indicates satisfactory completeness. Reports have been issued in abridged form in the monthly bulletin, which has recently been discontinued.

Communicable-disease control.—Measures for communicable-disease control are in accord with accepted standards and reporting is satisfactory except in the case of measles and whooping cough, there being only 4.3 cases of measles per death reported annually, while the number of cases of whooping cough is not stated. Excellent hospital facilities (94.6 beds per 100,000 population) are provided for cases of communicable disease, and 90 per cent of the cases of typhoid, 32 per cent of the cases of diphtheria, 41 per cent of the cases of scarlet fever, and 92 per cent of the cases of smallpox are thus cared for.

Tuberculosis.—There were 271 cases with 121 deaths reported. Clinic facilities are provided in the city dispensary located in the welfare building, and

1,037 nursing visits were paid in behalf of tuberculosis cases during the year by health-department nurses. There are 50 beds available in the local hospital of the health department for tuberculosis cases, with 50 additional beds available in State institutions. A total of 130 patients was admitted to hospitals during the year.

Venereal diseases.—Reporting in accordance with State law is by office number to the local health department. A total of 116 cases of syphilis, 72 cases of gonorrhea, and 6 other cases has been thus reported during the year. Both day and evening clinic facilities are available at the dispensary, where 90 cases of syphilis, 62 cases of gonorrhea, and 12 other cases received treatment. General nursing service is provided by the health department, while social-service work is done by the public-charities department.

Child hygiene.—A separate division of child hygiene is organized in the health department with a full-time director in charge. Of the 3,265 live births in 1923, 31.7 per cent were delivered by midwives, supervised by both State and local health departments, while 37 per cent occurred in hospitals. Instruction is given to expectant mothers by the visiting-nurse association in their home visits. Six infant-welfare clinics are held in the school buildings with additional clinic service provided at the city dispensary, where medical, nursing, and instructive service is rendered, supplemented by home nursing by the health department staff. A total of 1,843 children under two years of age paid 4,360 visits to clinics during the year, while 50,000 visits by nurses and 308 visits by physicians were made in the homes of children of preschool age. Health supervision of children of the public and parochial schools is also maintained by the health department, dental supervision of children of the public schools being provided by the board of education. A complete physical examination is given the children of the first and fifth grades once a year, and 23 per cent of the defects found are reported corrected. Children applying for working papers are required to pass a physical examination given by an official of the health department.

Mental hygiene.—A mental-hygiene survey has recently been made under the guidance of the mental-hygiene committee of the central council of social agencies. There is no organized activity for the promotion of mental health in Bridgeport except that exercised by the State department of health and private agencies.

Industrial hygiene.—The only industrial hygiene work in the city is that carried on by individual concerns.

Public-health nursing.—A total of 26 nurses was maintained by the health department and 22 nurses by the visiting-nurse association, giving a ratio of 30.3 nurses per 100,000 population working on the specialized plan.

Laboratory.—A well-equipped laboratory is maintained which provides the usual bacteriological and chemical services for physicians and clinics of the city in addition to a large number of analyses of milk, water, liquors, garbage greases, and tankage. A total of 215 examinations per 1,000 population was made in 1923, approximately half of them being of a diagnostic character.

Food.—Regular inspections are made of the dairies producing milk for the city, and tuberculin testing of all herds producing raw milk is required. There are eight milk plants, in which 90 per cent of the milk supply was Pasteurized under systematic inspection. The total per capita consumption of milk amounted to 0.8 pints daily, which is less than the desirable minimum of one pint per day. Inspections of food-handling establishments are made systematically and licenses are issued for restaurants, ice-cream peddlers, and out-of-town dealers, while permits are issued to milk dealers and retailers.

Sanitation.—General sanitary inspections are carried on under the district plan by seven inspectors. They made a total of 21,748 inspections, a large proportion of which were routine house-to-house inspections on the initiative of the department. The method of garbage disposal, which is under health supervision, is by the reduction process. Special measures directed against flies include the requirement for the use of tight bins and the frequent removal of manure.

Public utilities.—The public water supply, privately owned, is obtained from surface sources and chlorinated before being served to 98 per cent of the population. Two hundred and twenty private wells were in use in outlying districts. Both the separate and combined systems of sewerage are employed and 80 per cent of the population was accommodated. Treatment consists of fine screening before discharge of the sewage into the harbor.

Public-health education.—This work is conducted by the health officer and the directors of the various divisions of the health department. Press notices are regularly issued and an annual report of 1,500 copies is published. A monthly bulletin was published until the end of 1923.

Special comment.—Special progress has been made in the development of child-hygiene work since 1920 and in the extension of laboratory service. Progress in the child-hygiene work is the result of an organized campaign for reduction of infant mortality based on a comprehensive five-year program, emphasizing the value of education of mothers and expectant mothers. Supervision of working conditions should be undertaken through factory inspection by the department of health, and the general education effort of the department might well be extended.⁸

BUFFALO, N. Y.

Buffalo is an industrial city of 536,718 people, classified as 75 per cent native white, 24 per cent foreign born, and 1 per cent colored. The population per square mile was 12,730. The total taxable valuation amounted to \$1,346 per capita.

Administration.—The form of municipal organization consists of a commission. There is an advisory council of 20 members appointed by the health commissioner in addition to a board of health of five members elected for four-year terms, made up of the board of councilmen, according to the city charter. The health commissioner is appointed by the city council for an indefinite term on a full-time basis at a salary of \$6,000 a year. He has broad administrative powers.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.72 per capita, including \$0.05 for plumbing, and \$0.08 for housing inspection. This compares with \$0.72 expended in 1920, of which \$0.71 were for health-protective service other than hospital care.

Vital statistics.—The collection of vital statistics is carried on through a special bureau of the department of health. Certificates are checked for completeness and it is probable that 99.9 per cent of the births and 100 per cent of the deaths are reported. Monthly reports are distributed.

Communicable-disease control.—There is an average of 2.5 cases of typhoid and 12 cases of diphtheria for each annual death from these diseases, as compared with standards suggestive of completeness of 10 and 15, respectively, set down in the appraisal form of the committee on administrative health

⁸ Since 1923 plans for the development or extension of these services have been formulated, and certain of them have been realized.

practice. Card files of communicable-disease cases are maintained with other epidemiological information such as milk dealers and school data. Chronological charts of cases are maintained. There is a total of 27 hospital beds per 100,000 population available for communicable diseases. From 92 to 95 per cent of the school children have been vaccinated against smallpox. Up to April, 1924, approximately 34,000 children had been immunized against diphtheria.

Tuberculosis.—There were 964 cases with 533 deaths reported. Nurses' visits in behalf of tuberculosis cases number 18,561, while 1,711 clinic patients were on the active records as having paid a total of 2,055 visits. There were 869 new patients admitted to hospitals during the year.

Venereal diseases.—A total of 1,721 cases of syphilis, 1,134 cases of gonorrhea, and 82 other cases was reported. Clinic facilities are provided at the Buffalo City Hospital and at the Children's Hospital, 697 cases of syphilis, 137 cases of gonorrhea, and 72 other cases having been treated at these institutions. There are 35 hospital beds available for venereal-disease patients.

Child hygiene.—A total of 224 prenatal cases made 608 visits to clinics. Midwives, who attended 19 per cent of all births, are supervised in accordance with county and State regulations. There are 21 health department infant welfare clinics, where 5,207 children of preschool age made a total of 18,961 visits to clinics, while 33,652 nurses' visits were made in behalf of infants of these age periods. A total of 13,095 children of ages 2 to 5 inclusive visited clinics during the year. Children of the public and parochial schools are given the benefit of school-health supervision under the bureau of child hygiene of the health department. There is an average of one physician (on a part-time basis) for 3,749 pupils and one nurse for 4,218 pupils. A complete physical examination is given children of all grades at least every two years. A total of 44,577 examinations was made in 1923, and 26,313 defects discovered, while 8,275 defects were corrected. The children applying for working papers are first required to pass a physical examination given by the health-department physician. A special clinic for mental-hygiene cases is maintained at the city hospital in addition to the provision of a ward for special cases there. Cooperation is also received from the staff of the city hospital in the maintenance of three mental-hygiene clinics.

Industrial hygiene.—Under the laws of the State of New York, all matters pertaining to hygiene in industrial plants are officially under the supervision and control of the New York State Industrial Commission, which maintains a branch office in Buffalo.

Public-health nursing.—The health department employed 37 nurses and the district nurse association 52, giving a ratio of 16.5 nurses per 100,000 population.

Laboratory.—A public-health laboratory is maintained where 72 diagnostic examinations per 1,000 population were made during the year, in addition to a total of 22,604 bacteriological and chemical analyses of water and milk. Special researches are also carried on.

Food.—An effort is made to inspect and score the 2,800 producing dairies once a year. Tuberculin testing of herds from which certified milk is sold is required, and 99.5 per cent of the milk supply was Pasteurized. The per capita milk consumption amounted to 0.7 pint daily, which is 0.3 pint less than the desired standard. Supervision is exercised over slaughterhouses, food stores, manufacturing plants, and a physical examination is required of food handlers in bakeries and restaurants once a year.

Sanitation.—General sanitary inspections are made in routine and as a result of citizens' complaints for the abatement of nuisances. Special activities include inspections of street cars and boarding and rooming houses. Plumbing inspection is a function of the health department. Special measures are directed against fly and mosquito breeding.

Public utilities.—The public water supply, owned by the city, is derived from Lake Erie and is treated by chlorination before being supplied to all of the people. The findings of the health department laboratory indicate that 2.7 per cent of the 1 c. c. samples of treated water show *B. coli* present. The combined and separate sewers are employed and are accessible to over 99 per cent of the population. The sewage is discharged untreated into nearby rivers. There are 45 privy vaults still in use under the supervision of the health department.

Public-health education.—A director of publicity and health education is employed. An annual report of 500 copies, and a monthly bulletin of 4,500 copies are issued. The daily press is utilized, and members of the health department deliver lectures on various health subjects.

Special comment.—There is need for increased appropriations for the health department to provide for an increased nursing staff, for additional supervision of communicable-disease case isolation at home, and for the follow-up of defects found among school children in order to secure their correction.

CAMBRIDGE, MASS.

Cambridge is a city of 111,444 people, of whom 65.9 per cent are native white, 29.3 per cent foreign born, and 4.8 per cent colored. The city occupies an area of 6.5 square miles, giving a population per square mile of 17,145. The taxable valuation was \$1,320 per capita.

Administration.—This city is governed by a mayor and council. A board of health of three members is appointed by the mayor for a term of three years. It is required that one of the members be a practicing physician. The board has absolute control of measures for protecting the public health, including the appointment and dismissal of subordinates, the fixing of salaries, the making of rules and regulations. The health officer, or medical inspector, so called, is appointed by the board of health for an indefinite term on a part-time basis at a salary of \$2,700 (\$3,200 in 1925). The position is under civil service. He is also chief school physician and superintendent of the tuberculosis hospital.

Expenditures.—The expenditures of the health department in 1923 amounted to \$1.36 per capita of which \$0.47 was for hospitals and \$0.20 for poor relief. This compares with an expenditure of \$0.65 per capita in 1920, \$0.30 of which was devoted to hospital service.

Vital statistics.—The city clerk is registrar of vital statistics and transmits copies of birth and death reports to the health department. Deaths are classified by age and sex. A report is published annually. Death certificates from communicable diseases are routinely checked against disease reports.

Communicable-disease control.—The reporting of the principal communicable diseases is apparently quite complete as judged by the ratio of cases reported to the number of deaths. Measures for the control of communicable diseases correspond with standards of the American Public Health Association, except for the continued practice of gaseous fumigation after cases of diphtheria, scarlet fever, smallpox, acute anterior poliomyelitis, and tuberculosis.

Tuberculosis.—There were 171 cases with 113 deaths (29 nonresidents) reported. There were 524 patients during the year (162 new patients) who

made 856 clinic visits, while 2,091 home visits were made to 760 cases by the two field nurses of the department. There are 90 beds for tuberculosis cases in the Cambridge Tuberculosis Hospital, and 181 patients were admitted during the year.

Venereal diseases.—Cases are reported by number to the State health department, and by name and address only if treatment has been discontinued earlier than prescribed. Five clinics in Boston were used by Cambridge cases. There were 40 cases of syphilis and 162 cases of gonorrhea reported in 1923. Sanitary inspectors investigated 186 lapsed cases among males, and nurses investigated 32 lapsed cases among females, 40 per cent being located and returned for treatment.

Child hygiene.—There were 987 nurses' visits made in behalf of prenatal cases, while there were 20,677 nurses' visits to infants under 2 years of age. Six clinics maintained by the health department and Visiting Nurse Association were attended by 1,574 children under 2 years of age who made 9,408 visits.⁹ Health supervision of children of the public and parochial schools is carried out by the health department. Children of the first, fourth, and eighth grades are examined every year, 14,878 pupils having been examined. Fifty per cent of the health defects and over 50 per cent of the defects of vision received treatment or special care. The work of Schick testing and immunizing children against diphtheria was undertaken in 1922 and daily clinics are held for this purpose. Children under 21 years of age applying for working papers must present proof of date of birth, while those under 16 years of age must pass an examination and present a certificate of freedom from physical defects. Two clinics maintained by voluntary agencies offer facilities for diagnosis of mental cases.

Industrial hygiene.—This work is carried on by the State board of labor and industry and by individual factories.

Public-health nursing.—There were 18 nurses provided by the health department and 15 by the Visiting Nurse Association, giving a ratio of 29.6 nurses per 100,000 population.

Laboratory.—There were 1,388 diphtheria cultures examined, 664 sputum examinations, 83 Widal's for typhoid fever, and 40 other specimens examined in the laboratory.

Food and sanitation.—State regulations govern milk control. No inspections are made by the health department of dairy farms producing milk sold in the city. Ninety-five per cent of the milk supply is Pasteurized.¹⁰ The per capita daily consumption is 0.8 pint. Inspections are made as frequently as the limited staff permits of all food-handling establishments. Inspections are made chiefly as the result of complaints for the abatement of nuisances. The city is divided into five districts for sanitary inspection purposes, each in charge of an inspector. Scavengers are registered by the health department.

Public utilities.—The public water supply, owned by the city, is obtained from surface sources and treated by storage, coagulation, sedimentation, filtration, and chlorination before being served to all the people. Both the combined and separate systems of sewerage are employed, the sewage being discharged into the metropolitan district mains untreated. Over 99 per cent of the population was accommodated.

Public-health education.—An annual report of 600 copies is published and the daily press is utilized at irregular intervals. Lectures are delivered from

⁹ In 1924 Cambridge was credited with the lowest infant-mortality rate of any city of 70,000 population and over.

¹⁰ In 1925, 100 per cent of the milk supply is reported Pasteurized.

time to time by various members of the health department before civic organizations and in schools.

Special comment.—There are needed increased funds for health work in addition to increased medical and nursing personnel for communicable-disease control and the extension of clinic services.

CAMDEN, N. J.

Camden is an industrial city of 124,157 people, distributed over an area of 8.6 square miles, giving a population per square mile of 14,470. The total tax valuation was \$1,166 per capita.

The city is governed by a mayor and four other commissioners, who also perform the functions of a board of health and appoint the director of public health. The term of office of the health department executive is 1 year, and the present salary, on a full-time basis, is \$4,500 plus \$600 for transportation. In 1920 the health officer's salary was \$2,800. The present executive is a physician with previous experience in health administration. In view of the fact that the commission form of government was adopted and the health department reorganized during 1923, it is impossible to present a fair picture of health practice during that year. The few figures which are available are of little significance.

Suffice it to say that new divisions are being created covering the various health functions, and additional personnel has been secured to carry out the new program. The health department appropriation for 1924 was \$0.73 per capita, of which \$0.42 was for hospitals. Provision has been made by the health department for health supervision of children of the parochial schools, the supervision of pupils of the public schools being continued by the board of education. Five nurses have been added to the health department staff (there being none in 1920), while that of the board of education has been increased from 5 to 7, private agencies supplying 8, giving total of 20, or 16.1 per 100,000 population as compared with 12.9 in 1920. It is stated that 99 per cent of the total milk supply is Pasteurized by the holding process, and that temperature requirements call for the holding of milk at a temperature as low as 50° F. until it is delivered, but the daily per capita consumption is still far below the accepted standard of 1 pint per person daily. One hundred and twenty artesian wells supply the city with water which is not treated. Chemical examinations are made by the city chemist three or four times a month, while bacteriological examinations are made from time to time in the State laboratory. From 80 to 90 per cent of the total population was served by this supply. The combined system of sewerage is used by 75 per cent of the population. The untreated sewage is discharged into the Delaware River. Privies were still in use by about 30,000 people, but sewer connections are made as rapidly as sewer lines are extended. Inspection of privies is made in response to complaints and scavengers are licensed by the health department. Plumbing inspection of Camden was transferred to the building department in 1923.

There seems to be an excellent opportunity under the new organization to develop a modern health program in Camden. At present reporting of communicable diseases is quite incomplete,¹¹ relatively little has been under-

¹¹ The department now (1925) has convenient offices in the city hall, carries on the registration of vital statistics, has increased its nursing staff by two, and has established four health clinics. Reporting of major communicable diseases has improved in completeness.

taken toward the control of tuberculosis and venereal diseases, while the child hygiene program is in the development stage. Practically nothing is done in mental hygiene. The development of the division for supervision of milk supplies has been left until other divisions are more fully established because of the belief that present conditions are already fairly satisfactory and pressure is more needed elsewhere. These problems, together with the need for an active campaign of public health education are recognized by the new director of health and deserve consideration if Camden is to keep pace with cities of its size in disease prevention and health promotion.

CANTON, OHIO

Canton is credited with a population of 99,096 classified as 81.6 per cent native white, 16.9 per cent foreign born, and 1.5 per cent colored. The city occupies an area of 13 square miles, giving a population per square mile of 7,623. The taxable valuation amounted to \$1,527 per capita.

Administration.—The city is governed by a mayor and a council of 13 members. A board of health of five members is appointed by the mayor for a term of five years, to pass necessary regulations for the payment of bills, and appointment and dismissal of subordinates of the health department. The mayor is president of the board by virtue of his office. The commissioner of health is appointed by the board of health to serve for an indefinite term under civil service at a salary of \$4,000.

Expenditures.—Expenditures of the health department in 1923 amounted to \$0.32 per capita, for all health purposes. In 1920, \$0.32 per capita was expended by the health department, \$0.20 being devoted to health purposes.

Vital statistics.—The registration of vital statistics is conducted in accordance with State law, and both birth and death certificates are checked and verified for completeness. Classified tabulations are made.

Communicable disease control.—In general measures for the control of communicable diseases are in accord with accepted standards, except for the continuation of gaseous fumigation following cases of smallpox. Reporting of the principal communicable diseases is quite satisfactory. There are 20 hospital beds per 100,000 population for communicable disease cases. The use of the Schick test for determining the susceptibility of children to diphtheria has been started in schools, followed by the immunization of children found susceptible. Eighty per cent of the school children have been vaccinated against smallpox.

Tuberculosis.—There were 23 cases of pulmonary tuberculosis reported with 51 deaths, an indication of incompleteness of reporting of this disease. One free clinic is operated by voluntary agencies, there having been 42 clinic patients on the active records during the year as having made 58 visits to the clinic, while 1,815 nursing visits were made to homes. Eleven beds are available in the county hospital for advanced cases, there having been 28 patients admitted during the year.

Venereal diseases.—Reporting, in accordance with State law, is by name and address and by office number to the health department. There were 115 cases of syphilis and 13 cases of gonorrhea reported. A city clinic is operated two afternoons a week by voluntary agencies, where 185 patients made 793 visits during the year.

Child hygiene.—Of 2,499 live births, 8.8 per cent were attended by midwives who are registered in accordance with State law. Three infant welfare clinics are maintained by the visiting nurse association, while additional provision for infants is made at the city clinic. A total of 1,679 nurses visits

was made in behalf of children under two years of age, and 498 visits were made to preschool children. Health supervision of children of the public schools was carried on by the board of education which employs a full-time physician, 4 nurses, 1 dentist, and a dental assistant. A complete physical examination is given children from the first to the eighth grades. There were 15,011 examinations made during the year, and 7,004 defects found which were referred to parents for correction by private physicians. Children applying for working papers are required to pass a physical examination made by a school physician. There is no activity for the promotion of mental health.

Industrial hygiene.—The only industrial hygiene work is that carried on by individual concerns.

Public-health nursing.—There were 3 nurses employed by the health department, 4 by the department of education, 11 by the visiting-nurse association, and 1 by the public-health league (tuberculosis), giving a ratio of 19.1 nurses per 100,000 population.

Laboratory.—A public-health laboratory is maintained for the examination of milk, water, food cultures, sputum, gonorrhea smears, and miscellaneous specimens. A total of 71 diagnostic examinations per 1,000 population was made during the year.

Food.—There were 2,400 inspections of the 750 dairies producing milk for the city, which are regularly scored and supervised. Tuberculin testing of all herds from which raw milk is sold is required. Special measures are directed for the control of Pasteurization, and 96.6 per cent of the supply was Pasteurized. The per capita milk consumption amounted to 0.6 pint daily. Inspections are regularly made of food-handling establishments.

Sanitation.—General sanitary inspections are made routinely as well as in response to complaints for the abatement of nuisances. These inspections include the supervision of housing conditions in occupied dwellings. Special measures are directed against fly and mosquito breeding.

Public utilities.—The public water supply owned by the municipality is derived from drilled wells, over 99 per cent of the population being served. Laboratory examinations showed *B. coli* present in 3.5 per cent of the 10 cubic centimeter samples. A separate system of sewerage is employed and accommodated 85 per cent of the population. Sewage is treated by Imhoff tanks and contact filters, the effluent being discharged into the river.

Public-health education.—The health commissioner publishes an annual report in the form of a four-page bulletin and also issues a monthly bulletin. The daily press is utilized and the health commissioner delivers lectures from time to time on general health topics before civic organizations and parent-teacher associations.

Special comment.—There is need for increased provision of hospitalization for communicable-disease cases and for the development of an antituberculosis program with a provision for at least 50 more beds for cases needing this care. Special effort should be made to stimulate reporting of this important disease. There is also need for increased appropriations to make possible a development by the health department of more suitable provision for the care of maternity and infancy. Supervision of the children of the parochial schools should be placed upon the same basis as that of the children of public schools.¹² Nursing activities should be expanded and public-health education developed.

¹² In 1925 supervision of children in parochial schools is almost on an equal basis with that in public schools.

CHICAGO, ILL.

The population of Chicago was 2,886,971, classified as 66 per cent native white, 29.8 per cent foreign born, and 4.2 per cent colored. The city occupies an area of 201.3 square miles, giving a population per square mile of 14,341. The taxable valuation was \$620 per capita.

Administration.—The city is governed by a mayor and council. There is an advisory council of 100 members appointed by the commissioner of health for a period of one year. There is no board of health. The commissioner of health is appointed by the mayor on a full-time basis for a term of four years at a salary of \$10,000. The position is not under civil service. It is required that the commissioner be a physician duly licensed to practice medicine. His other official duties are in the capacity of director of the municipal tuberculosis sanatorium. The appointment and dismissal of subordinates rests with the commissioner under civil-service regulations. The fixing of salaries is a duty of the city council upon the recommendation of the commissioner. The making of rules and regulations, the issuing of orders, the hearing of appeals from orders, and the abatement of insanitary conditions, as well as the promulgation of special emergency regulations, rest with the commissioner of health. The department of health is organized by bureaus under full-time directors or chiefs, whose salaries are in proportion to that of the commissioner.

Expenditures.—The expenditures of the health department amounted to \$0.61 per capita in 1923. In 1922 the total was \$0.54, including \$0.11 for hospitals, \$0.02 for plumbing, and \$0.06 for miscellaneous activities. The expenditures of the health department in 1920 amounted to \$0.53 per capita, of which \$0.38 was for health service, \$0.11 being for hospital services, and \$0.04 for miscellaneous activities. This is one of the lowest appropriations for health service among cities of 250,000 population and over.

Vital statistics.—The collection and analysis of vital statistics is conducted by a full-time registrar in the health department. Both birth and death certificates are systematically checked for completeness and accuracy, and probably 93 per cent of the births and 100 per cent of the deaths are reported. Reports are issued weekly in the Health Bulletin, which is distributed to aldermen and other city officials, as well as to other persons interested in health affairs. Death certificates from communicable diseases are routinely checked against disease reports, and deaths under 1 year are checked against reported births.

Communicable-disease control.—Reporting of principal communicable diseases is apparently satisfactory, although the ratio of cases to deaths for typhoid, 8.3, is lower than the standard of 10 suggested as an indication of completeness. Control practices are in accord with accepted standards, except for the continuation of gaseous fumigation after cases of smallpox and tuberculosis.¹³ Hospitalization is well carried out. A total of 28,378 children under 6 years of age has been immunized against diphtheria. Eighty per cent of the school children have been vaccinated against smallpox.

Tuberculosis.—There were 10,105 cases with 2,335 deaths reported, a creditable record. Clinic facilities are provided at the Municipal Tuberculosis Sanatorium and at dispensaries. A total of 6,269 new patients was registered at the clinic during the year, while the total number of clinic visits by all patients numbered 202,563. There were 239,247 visits made by nurses in behalf of tuberculosis cases. A total of 2,004 hospital beds is available in city and county institutions for tuberculosis patients, 4,581 patients having been admitted during the year.

¹³ This practice was discontinued in 1924.

Venereal diseases.—Reporting in accordance with State and municipal regulations is by office number to the health department. There were 6,161 cases of syphilis, 11,634 cases of gonorrhea, and 654 other cases reported during the year. Clinic provision is made by the health department, there being from 10 to 16 clinics per week. A total of 45,457 clinic visits was recorded during the year. A separate nursing service is provided for this bureau chiefly for attendance at clinics, while a special social-service worker is also employed. Hospital facilities are available for bed cases, and 659 patients were hospitalized in 1923.

Child hygiene.—Of the 55,935 total births, 20.7 per cent were attended by midwives, who are registered and supervised by the State, and 44.4 per cent of the deliveries occurred in hospitals. There were 10,558 nurses' visits made in behalf of prenatal cases, while 4,396 clinic visits were made. There are 20 infant-welfare clinics conducted by the health department and 27 by the infant-welfare society. At these clinics 23,493 children under 2 years of age were registered as having made 119,773 visits to clinic, while 141,348 nursing visits were made to homes. There were 7,854 clinic visits made by children of ages 2 to 5 years, inclusive. Health supervision of children of the public, parochial, and private schools is conducted by the health department, while the board of education maintains a department of special schools for exceptional children. A complete physical examination is given all children from the first to the eighth grades once every four years by the physicians assisted by nurses. A total of 158,577 physical examinations was made; 121,692 of these children were defective and 302,960 defects were found. A total of 47,878 defects were corrected during the year. Special classes are provided for educationally exceptional children, for tubercular pupils, and for others with special defects, while 40,000 school lunches are served daily at a cost of 5 cents per lunch. Children applying for working papers must pass a complete physical examination given by a physician of the board of education.

Mental hygiene.—Clinic facilities for child study are provided by the board of education, while a neurologist is maintained by the health department.

Industrial hygiene.—A division of industrial hygiene was organized in 1924. This division is charged with the control of industries, other than food establishments, licensed by the city, such as laundries, barber shops, beauty parlors, soap factories, tanneries, hair industries, and the investigation of complaints concerning sanitary conditions in industrial establishments.

Public-health nursing.—A division of public-health nursing is organized in the bureau of child welfare with central supervision of nurses exercised. The health department provided a total of 169 nurses, while 43 nurses were supplied by the infant-welfare society, giving a ratio of 7.3¹⁴ nurses per 100,000 population.

Laboratory.—The public-health laboratory provides for the usual bacteriological and chemical examinations, 72 diagnostic examinations per 1,000 population having been made during the year. Special research work is also carried on.

Food.—Dairies producing milk for the city are inspected and scored once a year, the minimum score allowed being 70 on a United States Agricultural Department score card. There is no law regarding tuberculin testing of cattle, but the department has adopted a rule requiring that milk shipped from plants not holding a permit prior to 1924 must be obtained from herds under Federal

¹⁴ Exclusive of 142 nurses employed by Municipal Tuberculosis Sanatorium and possibly 100 or more nurses employed by private agencies other than the infant-welfare society.

and State supervision. Certified milk is produced under the supervision of a commission of the Chicago Medical Society and inspected by the department of health. The 267 milk plants in Chicago are systematically inspected, 99 per cent of the supply being Pasteurized. The per capita milk consumption amounted to approximately 1 pint per day. All establishments where food or beverages are handled, prepared, or stored are systematically inspected. Licenses are issued by the city collector after the establishments have been passed by the bureau of food inspection of the health department. All food establishments are scored quarterly. Control of drugs is one phase of the work of the bureau of food inspection.

Sanitation.—A bureau of engineering has been organized in the department of health. This includes the work of the newly created division of industrial sanitation and the community sanitation, housing, and other work previously performed by the bureau of sanitation. The engineering work of this bureau is conducted by the divisions of plumbing and new buildings, ventilation, smoke inspection, and water safety control. Inspections and attempts to secure the abatement of nuisances are made in the follow up of citizens' complaints. Special measures are directed against fly and rat breeding.

Public utilities.—The public water supply, owned by the city, is derived from Lake Michigan and is chlorinated before being served to 99 per cent of the population. Laboratory analyses of the treated water showed *B. coli* present in 16 per cent of the 10-cubic centimeter samples. The combined system of sewerage is accessible for 95 to 98 per cent of the people of the city, the sewage being discharged into the drainage canal for the most part untreated.

Public-health education.—An active campaign of public-health education is carried on by the health department through the publication of weekly bulletins, pamphlets, and an annual report, as well as through the utilization of the daily press, exhibits on food and milk, child welfare, ventilation, and special publicity activities. Lectures are frequently given by members of the department for social, civic, and religious bodies; lantern slides, and moving pictures being utilized.

Special comment.—Progress has been made since 1920 in securing an effective reorganization of the health department and in extending the service for the protection of maternity and infancy. The inspection forces have been organized into a unit called the inspection service. The 100 inspectors assigned two to a ward, working under the direction of a bureau chief and five supervisors, render nontechnical inspection service for all the bureaus of the department, including the quarantine work for the medical section. It is believed that plumbing inspection should be transferred to some other city department. There is needed increased personnel in order to secure more adequate follow up of school children having defects that these conditions may be corrected early.

CINCINNATI, OHIO

The population of Cincinnati was 406,312, 76 per cent of the people being native white, 16.5 per cent foreign born, and 7.5 per cent colored. The city occupies 72 square miles, giving a population of 5,643 per square mile. The taxable valuation amounted to \$1,901 per capita.

Administration.—The city is governed by a mayor and council, with a board of health of five unpaid members, appointed by the mayor for 10-year terms. The commissioner of health is appointed by the board under civil service to serve for an indefinite term, his salary being \$6,000 a year. The health depart-

ment is divided into various functional bureaus, child-hygiene work being handled under the division of medical inspection and relief.

Expenditures.—The per capita expenditure by the health department during 1923 amounted to \$0.33 all for health purposes except \$0.01 for medical poor relief.

Vital statistics.—Registration of vital statistics is handled by the health department. The International List of Causes of Death is used, all certificates of birth and death are regularly checked weekly as well as monthly, and all tabulations are made annually with classification by nativity, sex, age, and cause of death.

Communicable-disease control.—This work is organized under a bureau of medical inspection. Reporting of cases of typhoid may not have been as complete as is desired, as shown by the ratio of cases to deaths of 5.1 for the year. Only 38 cases of scarlet fever were reported for each death, and 40 cases of whooping cough, also suggesting somewhat incomplete reporting. Spot maps and card files are utilized in follow-up cases of communicable disease. It is stated that 50 per cent of the cases of typhoid fever, 22 per cent of the cases of diphtheria, 20 per cent of the cases of scarlet fever, and 100 per cent of the cases of smallpox are hospitalized. A total of 150 beds per 100,000 population is available for the acute communicable-disease cases. The children in all public, private, and parochial schools are vaccinated against smallpox, this being a compulsory procedure in Cincinnati. The practice in regard to isolation of the various communicable diseases and of immunization of diphtheria and smallpox contacts conforms to modern methods.

Tuberculosis.—A total of 879 cases of pulmonary tuberculosis with 458 deaths was reported. There are 268 beds available for tuberculosis patients, and 438 patients were admitted during the year. A total of 6,328 nursing visits were made in behalf of tuberculosis cases.

Venereal diseases.—Reporting of venereal diseases according to State health code is by name and address to the local health department and also to the State. Treatment facilities are provided by the health department at the health center clinic where 294 new cases of syphilis and 448 cases of gonorrhea were treated during the year. Provision is made for the necessary hospitalization of acute cases in the hospital.

Child hygiene.—Prenatal clinics are maintained by the health department and 60 expectant mothers attended during the year. Provision is made for obstetrical care by the maternity society. A total of 8,314 live births occurred in this city in 1923, less than 10 per cent of whom were attended by midwives who receive nursing supervision. Three infant welfare clinics are maintained, one at the health center and two in school buildings. Both medical and nursing service is rendered. Special clinic provision is made for children between 2 and 6 years of age, although the scope of activities is still somewhat limited. School health supervision consists in routine examination of children of all grades below the high school once each year by physicians assisted by nurses. A total of 43,222 examinations was made of the children of public and parochial schools. It is stated that 100 per cent of the school population has been vaccinated.

Public-health nursing.—Public-health nursing is under central nursing supervision and the generalized plan is followed by the health department nurses. Bedside nursing is rendered by the visiting nurse association, which has established a system of hourly nursing on a fee basis for those of moderate means. Including nurses of these two agencies and those of the babies' milk fund and Jewish organization, there was a total of 15 nurses per 100,000 population.

Laboratory.—A well-equipped public-health laboratory under a full-time director is maintained for the performance of the customary laboratory examinations. A total of 38,491 examinations (10,229 diagnostic) was made during the year. No research was carried on because of lack of funds and personnel.

Food.—The milk supply is obtained from 3,300 producing dairies which are inspected and scored at least once a year, 5,140 inspections having been made in 1923. Under the accredited-herd plan tuberculin tests are applied annually in some dairies and 60 per cent of the cows have been so tested. Ninety-eight per cent of the total milk supply was Pasteurized by the holding process. The average daily consumption amounted to 33,000 gallons of milk, which is somewhat below the desired amount. Permits are required for meat markets. Physical examination of food handlers is not made in routine. It is required that eating utensils in restaurants be sterilized by the use of hot water. The usual inspections of food establishments are made.

Sanitation.—General sanitary inspection includes barber shops and investigation of complaints for the abatement of nuisances. Legal provisions require fly-tight boxes for stable manure and weekly removal. Antimosquito measures include filling, draining, and oiling. Much educational work is done for rodent extermination.

Public utilities.—The public water supply is obtained from the Ohio River and the water is treated by sedimentation, coagulation, filtration, and chlorination. Over 90 per cent of the population was served by this public supply. There were about 700 private water supplies, of which 600 were cisterns and 100 were wells under supervision of the health department, in addition to 15 or 20 springs. The sewerage system is chiefly of the combined type and was accessible for approximately 68 per cent of the total population. Treatment of the sewage is confined to one trickling filter in one section of the city. The sewage is discharged raw, with the exception of that from this one small plant, into the Ohio River. There were said to be 4,000 privy vaults and 2,000 cesspools still in use in the suburbs, which are under the supervision of the health department and inspected annually.

Public-health education.—Health education and publicity are handled directly by the health commissioner, who utilizes the daily press, health exhibits, and special forms of publicity. Various members of the staff deliver lectures from time to time before civic groups.

Special comment.—Progress has been made in the organization of the health department and in the expansion of child hygiene work. Additional personnel is needed to permit the development of research work in the laboratory in addition to an increased nursing staff.

CLEVELAND, OHIO

Cleveland is an industrial city of 888,519 population, classified as 65.7 per cent native white, 30 per cent foreign born, and 4.3 per cent colored. The city occupies an area of 69.2 square miles, giving a population per square mile of 12,840. The tax valuation was \$2,097 per capita.

Administration.—The health department is organized as a division of the department of public welfare, with eight principal subdivisions for carrying on the various health functions. Public-health committees of the chamber of commerce and of the academy of medicine cooperate with the health department, although there is no advisory council or board of health. The commissioner of health is appointed under civil service by the director of public welfare to serve for an indefinite term at a salary of \$5,700, \$2,400 being charged to the division

of health and \$3,300 to the municipal tuberculosis sanatorium on account of his service as medical director of that institution. The powers of appointment and dismissal of subordinates, making rules and regulations, and issuing orders rest with the commissioner of health, while salaries are fixed by city council.

Expenditures.—The 1924 appropriation of the division of health, all for health purposes, amounted to \$0.52 per capita. This compares with \$0.48 per capita devoted to health purposes in 1920.

Vital statistics.—Registration of vital statistics is conducted by the health department, and certificates of births and deaths are systematically checked and verified. Tabulations are regularly made with data classified according to color, nativity, sex, and age of individual, cause of death, and health districts, but reports are not published.

Communicable-disease control.—Methods for the control of communicable disease conform to accepted standards. Reporting of the epidemic diseases is fairly complete except for typhoid, there being only seven cases reported for each annual death, which is three cases less than the minimum to be expected. Hospitalization of communicable diseases is well carried out considering the fact that less than half the number of beds usually considered necessary (22 per 100,000 population instead of 50) is available for this purpose.

Tuberculosis.—There were 2,078 cases reported with 864 deaths. Provision for diagnostic service is made through eight clinics well distributed over the city. A total of 5,889 clinic patients (3,667 new patients) was on the active records during the year, as having made 26,129 visits to clinic. Visits by nurses in behalf of tuberculosis cases numbered 82,783. All contacts are kept under observation for five years, 9,757 cases now receiving this care. A total of 150 beds at city hospital, and 250 beds for adults, with 30 for children, at the municipal tuberculosis sanatorium is available, 878 patients having been admitted from the city in 1923. All cases returned from sanatoria are followed up for an indefinite period.

Venereal diseases.—Reporting is by name and address to the local health department, 1,563 cases of syphilis, 656 cases of gonorrhea, and 101 other cases having been reported during the year. Diagnostic and treatment facilities are available at the local hospitals, the city hospital, and diagnostic only at the clinic maintained at the city hall, a total of 963 cases of syphilis, 451 cases of gonorrhea, and 101 other cases thus receiving treatment. For all cases of venereal diseases 150 beds are available, 549 patients having been cared for in the city hospital.

Child hygiene.—Of the 21,707 live births 19 per cent were attended by midwives who are licensed and controlled by the State medical registration board. A registry of midwives with results of inspection is also maintained by the visiting nurses. Thirty-one per cent of the births occurred in hospitals. Nine prenatal clinics maintained by private agencies registered 3,736 expectant mothers, who made 12,506 visits. Nurses' visits in behalf of prenatal cases numbered 7,381. There are 16 infant-welfare clinics distributed over the city under the supervision of the director of child hygiene. A total of 7,937 children under 2 years of age paid 39,346 visits to clinics, and nursing visits in behalf of children of this age period numbered 71,425. Activities for the care of the preschool child are closely linked with the infant-welfare clinic and nursing service. Health supervision of the children in the public schools is performed by the department of physical welfare of the board of education, while supervision of the children of the parochial schools is a function of the bureau of child hygiene of the division of health. Generalized nurses are engaged in parochial-school work. Physical examinations of the children of the

elementary grades are made by the physicians assisted by nurses each year, but these examinations include heart and lungs in only a few instances. As a result of 55,822 examinations of children of the public schools, 35,222 defects were found, with corrections secured in 50 per cent of the cases. An average of 1.2 nurses is provided per 10,000 pupils in all public schools. A complete physical examination by a school physician is required of all children applying for working papers, and reexaminations are made on a change of occupation if one year has elapsed since the last examination.

Mental hygiene.—A child-guidance clinic dealing with the various problems of the child has been maintained with a psychiatrist in charge since December, 1924.

Industrial hygiene.—Industrial hazards are investigated by the State industrial commission and the bureau of industrial hygiene of the State board of health.

Public-health nursing.—A total of 103 nurses was employed by the health department to work on a generalized basis, in addition to 37 nurses employed by the board of education. These nurses work in close cooperation with the student nurses taking public-health courses at Western University School of Social Sciences.

Laboratory.—The usual free bacteriological and chemical service is provided, 54 diagnostic examinations per 1,000 population having been made in 1923.

Food and drugs.—Inspections of the dairies producing milk for the city are made by the staff of the division of health once a year, 12,153 such examinations having been made, and the dairies scored on the score card recommended by the United States Department of Agriculture. All dairy cattle from which milk of Grade A quality is sold must be tuberculin tested. The milk plants of the city, in which 98 per cent of the milk supply was Pasteurized, are closely supervised. The total per capita milk consumption amounted to 1 pint daily. Inspections are regularly made of food-handling establishments and licenses are issued to all concerns handling, storing, or selling food. A fee of \$1 for each license is charged annually. Routine field inspections of pharmaceuticals and narcotics are made by a representative of the division of health.

Sanitation.—General sanitary inspections are made primarily as a result of citizens' complaints for the abatement of nuisances, a total of 8,263 complaints (over 80,000 inspections and reinspections) having been recorded. Fly-proof receptacles are required for stable manure. Control of the smoke nuisance is in the hands of a special smoke commission not connected with the division of health.

Public utilities.—The public water supply owned by the city and derived from Lake Erie serves all of the people with water treated by filtration of one-third of the supply and chlorination of all. Laboratory samples of treated water showed 0.09 to 3.4 *B. coli* present in each cubic centimeter tested in 1922. The combined system of sewerage is employed and is said to accommodate nearly the entire population. There were about 2,000 privy vaults in unsewered districts. The sewage from the west side of the city is treated by Imhoff tanks, and the effluent is chlorinated in the summer, while that of the east side is merely screened, the effluent being discharged into Lake Erie. The task of garbage collection and disposal is conducted by the department of public service, the reduction method of disposal being employed.

Public-health education.—There is no separate bureau of education and publicity. The commissioner of health and heads of various bureaus deliver lectures before parent-teacher associations, civic and luncheon clubs, occasionally utilizing motion pictures and exhibits. Special subjects are discussed in the press daily, while radio health talks are given every two weeks.

Special comment.—Progress has been made during the past three years in more adequately providing for the supervision of school children, but the scope of health examinations should be broadened to include examination of heart and lungs at least three times during the school career. There is manifest need for increased health appropriations to allow for expansion of the work of the principal divisions of the department, and increased facilities should be provided for hospitalization of communicable diseases.

COLUMBUS, OHIO

Columbus is a city of 261,082 people, 83.8 per cent of whom are native white, 9.4 per cent colored, and 6.8 per cent foreign born. An area of 26.4 square miles is occupied, giving a population of 9,889 per square mile. The taxable valuation was \$1,550 per capita.

Administration.—A mayor and council of seven members govern the city. A board of health of five members, three of them physicians (although this is not a requirement), is appointed by the mayor for a term of four years each, one member being appointed annually. The board holds monthly meetings for the adoption of regulations, the fixing of salaries, and the consideration of health department problems. The board also appoints the full-time health officer, for an indefinite term, at a salary of \$4,200, which is \$420 more than paid in 1920. No special qualifications for this office are prescribed by law.

Expenditures.—Of the \$0.53 spent by the health department in 1923, \$0.47 per capita was for health purposes (an increase of \$0.17 per capita in three years), \$0.04 for hospitals, and \$0.02 for poor relief.

Vital statistics.—Registration is conducted by a registrar in the health department, and certificates are checked for completeness and accuracy with creditable results. Approved classifications are made of information contained on birth and death certificates, although no reports are issued.

Communicable-disease control.—The health commissioner employs practicing physicians as consultants in making diagnoses of various kinds. The house where a case of communicable disease exists is subsequently placarded by the sanitary police, after which time a nurse visits the house to obtain desired information for the records and to give instructions concerning quarantine and release. Reporting of typhoid, diphtheria, and scarlet fever meets the American Public Health Association standards, and is even better than average in the latter two diseases, there being 20.8 diphtheria cases per death and 84.3 scarlet fever cases per death reported. Only 76.7 cases of measles per annual death (standard 100) were reported, while 8.3 cases of whooping cough per death is one-third the suggested standard of 25. Only 9.6 beds per 100,000 population are available for communicable-disease cases, and while 75 per cent of the cases of typhoid are hospitalized only 20 per cent of the cases of smallpox and none of the cases of diphtheria and scarlet fever are thus cared for. Vaccination of school children is urged, and 75 per cent have been vaccinated.

Tuberculosis.—The fact that there were 278 deaths, with only 394 cases reported, indicates incompleteness of notification. There are available in city, county, and State institutions 234 beds, 100 of them for children, and 150 patients were admitted during the year. The Columbus Society for Prevention and Cure of Tuberculosis operates a clinic two hours every week-day afternoon, and maintains a staff of seven nurses who made 19,813 home visits, new cases being visited twice a week.

Venereal diseases.—Reporting by name and address to the State department is required, 157 cases of syphilis and 72 cases of gonorrhea having been thus

reported. One clinic is operated jointly by the city and the University Medical College and the State, 1,008 patients having made 8,735 visits. Nurses attend the clinic, and one nurse spends her entire time there and in follow-up work.

Child hygiene.—One prenatal clinic is operated by the College of Medicine, 334 expectant mothers being registered, with a total attendance of 607. Midwives are licensed and examined by the State medical board. Eleven pre-school and infant weighing stations are operated by the district nursing association, with medical service provided at two. A total of 1,734 babies was registered as under care, with 4,734 visits to clinic. Home nursing visits numbered 9,210. Health supervision of the 40,067 pupils enrolled in the 63 public schools is exercised under the board of education by a staff of two part-time physicians and four nurses, or 1.1 school nurses per 10,000 pupils. Children engaged in competitive athletics and those referred as special cases by the nurses are physically examined by a physician. Nurses inspect all children referred to them by teachers, and urge that children with defects visit the clinic or their family physician for correction. Special classes are provided for mental defectives and for crippled children, as well as an open-air school for closed tubercular cases. A physical examination by a school physician is required for children applying for working papers.

Public-health nursing.—All nursing work in the city, with the exception of tuberculosis and school, is done by the district nursing association, to which organization the health department contributes toward the salaries of personnel, there being 22 nurses on the generalized plan, of which 15 were partly paid by the health department. Through the efforts of the present city health commissioner and the superintendent of the district nursing association a plan was adopted which has finally evolved in the present one. A division of nursing has been created in the department of health and the associate superintendent of the district nursing association was made chief of that division, retaining, however, her position as associate superintendent of the district nursing association. Her salary is paid jointly by the nursing association and the department of health, and she, in turn, is jointly responsible to both of these agencies. With the four school nurses of the board of education and the seven nurses of the tuberculosis society, there were 11.9 nurses per 100,000 population.

Laboratory.—Provision is made for the usual free bacteriological service, 48 diagnostic specimens per 1,000 population having been examined. Considerable work is also done by the State laboratory located in the city.

Food.—The 2,350 dairies producing milk for the city are inspected and scored. Twice a year all herds from which raw milk is sold must be tuberculin tested. There are 18 milk plants in the city which are supervised, 70 per cent of the entire supply being Pasteurized. The daily per capita consumption of 0.7 pint is 30 per cent below the desired standard. Inspections are made of markets and retail food stores, bakeries, and restaurants, and none are scored. Physical examinations of food handlers are made semiannually for the detection of communicable disease.

Sanitation.—General sanitary inspection is in line with usual practice, housing inspection by this department covering only light, ventilation, and sanitary conditions of occupied dwellings. Special regulations applying to stable manure call for tight bins and removal every two weeks.

Public utilities.—The public water supply owned by the city accommodated 98 per cent of the population. Treatment of the water from the Scioto River is by softening, sedimentation, rapid sand filtration, and chlorination. The total extent of use of private supplies is very small, except for industrial purposes, no cross connections with the public supply being allowed. Both

combined and separate sewerage systems are in use, serving 95 per cent of the population. The sewage is treated by Imhoff tanks and sprinkling filters before discharge of the effluent into the river. Cesspools are generally used where sewers are not available.

Public-health education.—There is no regular program of health education.

Special comment.—A commendable plan of coordination of nursing work has been developed by the health department and the district nursing association. The health department appropriation has not been sufficiently increased to provide for the type of health program which might be expected in a city of this size. The sanitary code needs revision and increased facilities should be early provided for hospitalization of communicable-disease cases. Efforts should be made to secure early and more complete reporting of tuberculosis cases. Medical service is desirable at all the infant-welfare clinics, and preschool activities should be considerably expanded. Children of the parochial schools and public schools, as well as those in private schools, need health supervision, which should include a complete physical examination at least three times during school life for the discovery and subsequent correction of defects. A campaign of public-health education would seem to be indicated as needed.

DALLAS, TEX.

Dallas is a residential city of 182,274 people, classified as 79.4 per cent native white, 5.5 per cent foreign born, and 15.1 per cent colored. The population per square mile is estimated at 8,070. The total taxable valuation amounted to \$1,033 per capita.

Administration.—A mayor and commission govern the city. There is a board of health of 15 members appointed by the mayor for terms of one year each, 7 members being physicians. The health officer is appointed by the mayor and commission on a full-time basis at a salary of \$4,000 per year, to serve for an indefinite term. Employment of subordinates rests with the health officer with the approval of the mayor. The making of rules and regulations rests with the board of health as does the issuing of orders.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.75 per capita, \$0.63 having been for health purposes proper, \$0.12 for hospitals, and \$0.03 for mosquito control. In 1920 the entire \$0.59 spent by the department was devoted to health purposes proper.

Vital statistics.—The collection and analysis of vital statistics are functions of the health department and correspond with accepted practice. Certificates are regularly checked and verified for completeness and accuracy with satisfactory results.

Communicable-disease control.—Reporting of general epidemic diseases is reasonably complete. Aside from the continued use of gaseous fumigation after cases of diphtheria, scarlet fever, smallpox, cerebrospinal meningitis, and acute anterior poliomyelitis, control measures accord in general with accepted standards. Approximately 45 per cent of the cases of typhoid, 10 per cent of the cases of diphtheria, 5 per cent of the cases of scarlet fever, and 100 per cent of the cases of smallpox are hospitalized. Only 15 per cent of the school children have been vaccinated against smallpox.

Tuberculosis.—There were 132 cases with 112 deaths reported. This low ratio of cases to deaths suggests that cases are not discovered or reported to the health department in the early stages of the disease. Three clinics are operated under the auspices of the Dallas Tuberculosis Association. A total of 2,748 nursing visits was made to 1,886 cases (including nontuberculosis children) during the year.

Venereal diseases.—There were 415 cases of syphilis, 270 cases of gonorrhea, and 5 other cases reported to the health department in accordance with State law. One clinic is maintained through the cooperation of the local and State health departments.

Child hygiene.—One prenatal clinic is operated under the supervision of the Infant Welfare and Milk Association. In 1923 midwives, who are not supervised locally, attended 5.1 per cent of the births. Maternity homes are inspected and certified by the city health department to the State health department for approval. A total of 5,382 nursing visits were made to homes by infant-welfare nurses, and three infant-welfare stations were operated by voluntary agencies. There are no physicians or nurses employed in school health supervision in the city. There are 22 physical-training teachers who make physical inspections. No special examinations are required for children to secure working papers. A child guidance clinic has recently been established to aid in the problem of mental hygiene.

Industrial hygiene.—There were no special activities in this field.

Public-health nursing.—Seven nurses were employed by the health department and three nurses by the Dallas Tuberculosis Association.

Laboratory.—A total of 70 diagnostic examinations per 1,000 population was made in the public-health laboratory located in the city hall.

Food and sanitation.—Dairies producing milk for the city are inspected at intervals and are scored. Tuberculin testing of dairy herds is required once a year and 68 per cent of the milk supply is Pasteurized. Physical examination of food handlers is required and a food handlers' clinic is operated. All food-handling establishments are regularly inspected and scored. It is also required that ice cream must be made from Pasteurized milk or cream. General sanitary inspections are made in routine once a month, as well as in the follow-up of citizens' complaints for the abatement of nuisances.

Public utilities.—The public water supply owned by the city is derived from 5 wells and 5 reservoirs. Sedimentation and rapid sand filtration are employed at 2 plants, and all of the water for the city is chlorinated. The public supply served over 95 per cent of the population. Systematic laboratory supervision is exercised and about 6 per cent of the 10-cubic-centimeter treated samples showed *B. coli* present. The separate type of sewerage system is employed and was accessible for 95 per cent of the population. The sewage is treated in an Imhoff tank before discharge of the effluent into the river.

Public-health education.—A monthly bulletin of 15,000 copies is published in addition to special pamphlets. The health officer utilizes the press in publishing weekly statistical tables and delivers frequent lectures on various health topics before nurses, school children, and the general public.

Special comment.—Additional beds are needed for the care of such acute communicable diseases as diphtheria and scarlet fever, and provision should be made through additional funds and personnel for the development of a modern antituberculosis program. There is also need for the development, under the jurisdiction of the health department, of municipal protection for mothers and babies. School health supervision should be instituted to provide a thorough physical examination of each child at least three times during his school career, with medical and nursing personnel adequate to secure proper follow-up work and the correction of defects.

DAYTON, OHIO

Dayton is a city of 165,530 population, classified as 85.6 per cent native white, 8.5 per cent foreign born, and 5.9 per cent colored. The city occupies an area

of 16.7 square miles, giving a population per square mile of 9,911. The taxable valuation amounted to \$1,424 per capita.

Administration.—The city is governed by a city manager and a commission. A commissioner of health, appointed by the city manager for an indefinite term at a salary of \$4,000 a year, is responsible to the director of public welfare, there being no board of health nor advisory council. No qualifications for the office of the commissioner of health are prescribed by law. The city commissioners are responsible for the fixing of salaries of the subordinates of the health department, while appointment and dismissal rests with the city manager through the director of public welfare.

Expenditures.—The per capita expenditure of the health department in 1923 amounted to \$0.46, 82 per cent having been for salaries. This compares with \$0.44 per capita devoted to health purposes in 1920.

Vital statistics.—The registration of vital statistics is conducted by a special registrar of the health department, and checks of birth and death certificates indicate completeness.

Communicable-disease control.—The reporting of cases of diphtheria and scarlet fever seems to be fairly complete, as indicated by the number of cases reported for each death. Only 7 cases per death of typhoid, only 6.9 cases per death of measles, and 3 cases per death of whooping cough are reported, indicating definite incompleteness for these diseases. Provision is made for release of typhoid-fever cases from isolation subject to bacteriological examination of the excreta. The number of communicable-disease hospital beds per 100,000 population amounted to 24.2 and the number of cases hospitalized conforms to accepted standards.

Tuberculosis.—A total of 136 deaths with 79 cases indicate very incomplete reporting of this disease. There seems to be little intensive antituberculosis work done in the city. Two clinics are provided in general hospitals, but records indicate that only 171 patients are under observation. Visits by nurses in behalf of tuberculosis cases numbered 2,135. A total of 55 beds are available in county institutions, and 165 patients were admitted during the year.

Venereal disease.—The reporting of venereal diseases is by name and address through the local health department which transmits the reports to the State department. There were 406 cases of syphilis and 145 cases of gonorrhea reported during the year, this number of patients having received treatment at the venereal-disease clinic operated by the health department. Follow-up work is done by the clinic nurse, who made 183 visits.

Child hygiene.—Prenatal, infant, and preschool hygiene work is carried on by the health department. The visiting nurse association made 1,366 visits to the homes of patients for the purpose of giving prenatal advice or instructions. This organization, while supported by voluntary and private funds, occupies offices at the health department and is under the general direction of the commissioner of health, performing all phases of public-health nursing. One prenatal clinic is operated by the Miami Valley Hospital. Midwives are not supervised. Two infant-welfare clinics are operated by the health department and visiting nurses. Health supervision of the 24,571 children enrolled in 33 public schools is exercised jointly by the health department and the board of education, by a staff of 5 part-time physicians, 6 nurses, and 4 dentists. A physical examination is given children in all grades on admission, with annual follow up thereafter, but this examination does not include heart and lungs unless specially indicated. Records are not complete as to the defects found

and corrected. Children applying for working papers must be examined by the school physician.

Mental hygiene.—A mental-hygiene clinic is operated by the superintendent of the State hospital in cooperation with the board of education. The local health department depends entirely upon State activities in this field.

Industrial hygiene.—The principal industrial concerns have organized industrial medical service, but otherwise there is no activity locally.

Public-health nursing.—Public-health nursing is on a generalized basis with central supervision and offices in the health department, except for the 6 school nurses employed by the board of education. The number of nurses per 100,000 population was 11.5.¹⁵

Public-health laboratory.—Public-health laboratory service provides for the usual free bacteriological and chemical examinations for the city. A total of 84.5 diagnostic examinations per 1,000 population were made in 1923.

Food.—Effort is made to inspect and score the 2,084 dairies producing milk for the city twice each year, 3,098 such inspections having been made. The 31 milk plants, in which 97 per cent of the supply was Pasteurized, are regularly supervised by inspection and by laboratory analysis of the product. Inspections are regularly made of all food establishments, and permits are issued for the operation of food places. Physical examination of food handlers is required, such examinations being made either by private physicians or by district physicians. Systematic supervision is exercised to insure proper cleansing of eating and drinking utensils.

Sanitation.—General sanitary inspection covers the usual lines of activity, and house-to-house inspections are made each spring in routine, in addition to the follow-up of complaints. Special provisions are made for the storage of stable manure in tight bins and for prompt removal to prevent fly nuisance.

Public utilities.—The public water supply, owned by the city of Dayton, served 85 per cent of the population with water from 141 driven wells, the water being chlorinated. It was reported that 300 private wells were in use in outlying districts. The separate sewerage system was utilized by 99 per cent of the population, the sewage being discharged untreated into the Miami River. A total of 300 privy vaults was still in use, but connections to the main sewer lines are required as rapidly as extension of lines makes this possible.

Public-health education.—An annual report and monthly bulletins are regularly published, lectures on general health subjects are given, while exhibits and the daily press are utilized.

Special comment.—Progress has evidently been made in securing more complete reporting of venereal diseases and in the development of a program of infant welfare. An active antidiphtheria campaign has resulted in the Schick testing and immunization of several thousand children. The close cooperation existing between the visiting-nurse organizations and the local health department is commendable. A several years' survey by local health officials to determine Dayton's health needs was completed in 1924. The health appropriation, including the salary of the health officer, should be increased to provide for additional personnel, leading to more extensive activities in nursing, child hygiene, and clinic service. Reporting of cases of tuberculosis should be stimulated, and organized clinic and nursing service for the control of this disease should be developed. Provision should be made for complete physical examinations of children of the public and parochial schools to include heart and lungs at least three times during the school career.

¹⁵ Exclusive of approximately 24 nurses employed by voluntary agencies.

DENVER, COLO.

The population of Denver was 272,031, distributed over an area of 58.7 square miles, giving a population of 4,634 per square mile. The total taxable valuation amounted to \$1,429 per capita.

Administration.—The city is governed by a mayor and a common council. There is an advisory council of five members appointed by the manager of health and charities, who is the executive officer of the health department. His salary is \$4,000 on a full-time basis. He is appointed by the mayor for a term of four years. He does not serve under civil service. There are no special qualifications prescribed by the law. The manager of health and charities is in charge of the city and county health department, the charity department, Denver Hospital, contagious-disease hospital, the tuberculosis hospital and dispensary, the Denver Farm, Detention Home, and the city markets. He has deputy managers in charge of the several divisions.

Expenditures.—The total expenditure by the health department in 1923 amounted to \$0.43 per capita, of which \$0.07 was for hospitals and \$0.01 for medical poor relief. In 1920, \$1.62 per capita were expended, \$0.39 being for health service, \$0.75 for hospital service, and \$0.48 for miscellaneous services.

Vital statistics.—Registration is conducted by the staff of the city health department. It is indicated that probably 90 per cent of the births and 100 per cent of the deaths are reported. Reports are issued monthly through the press.

Communicable-disease control.—Reporting of the principal communicable diseases, except typhoid fever, is apparently satisfactory, the number of cases of typhoid fever in relation to the annual deaths (5.1) is only half the standard suggested as an indication of completeness. Gaseous fumigation is practiced after cases of diphtheria, scarlet fever, and smallpox. Hospitalization is well carried out, there being 27.5 hospital beds per 100,000 population. Vaccination of school children against smallpox is compulsory, 20 per cent having been thus protected.

Tuberculosis.—There were 575 deaths from tuberculosis recorded, but information as to the number of cases is not available, as cases are not reported to the health department. Clinic facilities are maintained by the health department at a cost of approximately \$16,000 annually. The number of visits by nurses in behalf of tuberculosis cases total 8,408. Hospital facilities are provided in local and county institutions and are utilized.

Venereal diseases.—Reporting in accordance with State and municipal regulations is by office number to the health department, but there are no records available as to the number of cases thus reported. No clinic facilities are maintained by the city (except for the examination of cases sentenced to jail on vagrancy charges), although the city hospital admits special bed cases from time to time. The State board of health maintains in Denver one clinic for men and one for women supported entirely by State and Federal funds. This is open three afternoons and three evenings weekly, 529 cases of gonorrhea and 872 cases of syphilis having been treated.

Child hygiene.—There is no special organization for child-hygiene work by the health department. Midwives are required to register, but are not supervised thereafter. Nine infant-welfare clinics are conducted by the visiting nurse association, which are attended by 3,919 children under 2 years of age who paid 12,712 visits. A total of 17,741 nurses visits was made in behalf of children of this age period. Health supervision of children of the public schools is carried on by the board of education, a complete physical examina-

tion being made annually of children of the first grade. It is estimated that 10 per cent of the defects found are corrected. Children applying for working papers are not required to be physically examined before being issued a certificate. There has recently been organized by the board of education a department of psychiatry for the examination of special cases selected by teachers.

Industrial hygiene.—There is no official organization to carry on industrial hygiene work in the city.

Public-health nursing.—Fifteen nurses were provided by the board of education, 23 by the visiting nurse association, and 5 on the health department pay roll, giving a ratio of 15.8 per 100,000 of population, on a specialized basis, except for 20 of the nurses of the visiting nurse association, who do generalized work.

Laboratory.—A total of 33,633 diphtheria cultures, 1,972 specimens for syphilis, 1,436 malarial smears, 635 tuberculosis smears, 4,711 urine samples, 435 gonorrhea smears, and 54 specimens were examined in the laboratory of the health department maintained at the general hospital.

Food and sanitation.—A total of 2,000 inspections was made of the 1,650 dairy farms producing milk for the city. Tuberculin testing of all cattle from which raw milk is sold became a requirement in 1925. Eighty-one per cent of the milk supply was Pasteurized in 1923. The per capita milk consumption amounted to 0.9 pint daily. General inspections are made of food supplies. House-to-house inspections are made in routine as well as in follow-up of citizens' complaints for the abatement of nuisances. The collection and disposal of garbage and refuse are supervised by, but not charged to, the health department, disposal being by hog feeding.

Public utilities.—The public water supply owned by the city is obtained from the river and is filtered and chlorinated before being served to 96 per cent of the population. It is stated that *B. coli* are rarely ever found in 10-cubic centimeter samples of the treated water. Private water supplies are chiefly from artesian wells. The separate type of sewerage system is employed and is accessible for 70 per cent of the population, the sewage being discharged untreated into the river.

Public-health education.—There is no division of education and publicity. The health officer utilizes the daily press for the publication of general stories, while lectures are delivered by the health officer and his assistants to schools and civic organizations. The publication of a monthly bulletin was started in 1924.

Special comment.—A larger appropriation for health service proper is needed. Measures for the control of communicable diseases should conform more nearly to standards accepted by the American Public Health Association.¹⁶ The city department of health should take a more active part in the control of venereal diseases and in the protection of maternity and infancy. Pasteurization of milk should be required and public-health education work developed. As pointed out in 1920, while it is recognized that Denver carries a heavy burden because of its selection as a health resort, there being many tuberculosis sufferers from other sections of the country, the high death rates among various ages and from various causes would appear to be due not only to the large invalid population which collects in Denver but in part to insufficient provision of modern and efficient preventive services through the health department.

¹⁶ Progress in this regard has been made since 1923.

DES MOINES, IOWA

The population of the residential city of Des Moines was 140,923 classified as 84.4 per cent native white, 12 per cent foreign born, and 3.4 per cent colored. The population per square mile averages 2,258 persons. The total taxable valuation amounted to \$621 per capita.

Administration.—The city is governed by a commission. The city council serves as a board of health when acting on health matters, with the mayor as president of the board. The health commissioner is appointed by the mayor, with confirmation by council, on a full-time basis for a term of two years at a salary of \$3,300. Qualifications prescribed by law specify that the health commissioner must be a graduate in medicine who has resided in the city for at least two years.

Expenditures.—The health department expenditures in 1923 amounted to \$0.36 per capita, practically the entire amount having been set aside for health purposes proper. In 1920 this same amount of money per person was devoted to health purposes.

Vital statistics.—Registration of vital statistics is conducted by a local State registrar. Reports are made to the State office by the local registrar and copies are sent to the health department. It is stated that 92 per cent of the births and 100 per cent of the deaths are reported. There are no published reports distributed.

Communicable-disease control.—Reporting of cases of diphtheria and scarlet fever seems to be fairly complete, but during the year studied the ratio of cases to deaths for typhoid, measles, and whooping cough is sufficiently low to indicate incompleteness in reporting of these diseases. Reports of communicable diseases are maintained in a simple daybook and spot maps and chronological charts are utilized. There are 49.6 hospital beds per 100,000 population for cases of communicable diseases, and 50 per cent of the cases of typhoid fever, and 30 per cent each of cases of diphtheria, scarlet fever, and smallpox are thus cared for. Gaseous fumigation is still practiced after cases of diphtheria, scarlet fever, smallpox, cerebrospinal meningitis, and acute anterior poliomyelitis.

Tuberculosis.—The fact that 80 deaths from tuberculosis (all forms) were recorded, with only 10 cases reported, is an indication of lax reporting of this important disease. Facilities for hospitalization are provided in State and county institutions. Clinic service is rendered at the health centers, where the building and equipment are provided by the city. A total of 239 clinic visits was made during the year while 1,657 visits by nurses were made in behalf of tuberculosis cases.

Venereal diseases.—The State law requires that cases of venereal diseases be reported by number to the local health department. A total of 7,443 cases of syphilis and 9,394 cases of gonorrhea was treated in the city venereal disease clinic during the year ending March 31, 1923.

Child hygiene.—One prenatal clinic is maintained at the health center where a part-time physician is employed. The practice of midwifery is not supervised inasmuch as such practice is deemed illegal by State regulations. A total of 434 prenatal patients was visited by the public health nurse association which cooperated with the health department, while 1,601 visits were made to clinics. Five infant welfare stations are also maintained by the local nurse association, and 763 children under 2 years paid a total of 3,653 visits to clinics during the year, while 10,587 nurses' visits were made in behalf of

infants of this age period. A total of 152 visits to preschool clinics was made by children of ages from 2 to 5 inclusive. Health supervision of children of the public schools is carried on under the board of education by a part-time medical director and a staff of 4 medical examiners, 19 nurses, 1 dentist, and 1 hygienist. Two nurses of the health department serve in the parochial schools. A physical examination is made of public school children of the kindergarden, third, sixth, and eighth grades, and of certain high-school pupils. A total of 5,073 defects were found among 3,079 children of the public schools examined during the year, while 4,151 defects were corrected. Examination of applicants for working papers has recently been undertaken.

Mental hygiene.—In connection with the complete physical examination given children at the health center, observations are made as to mental status. A school for mental defectives is operated by the board of education.

Industrial hygiene.—There are only a few large industrial plants in the city, and there is no organized industrial hygiene work.

Public health nursing.—Two nurses were employed by the health department, 19 nurses by the board of education, and 14 nurses by the public health nurse association, giving a ratio of 24.8 nurses per 100,000 population, working on a specialized basis.

Laboratory.—The usual free diagnostic bacteriological and chemical laboratory services are provided. A total of 5,826 specimens was examined during the year.

Food.—There were 2,300 inspections made of the 1,500 producing dairies. All cows from which raw milk is sold are tuberculin tested once a year. It is stated that 87.5 per cent of the milk supply was Pasteurized. The per capita consumption of milk amounted to 0.8 pint daily, which is 0.2 pint less than the minimum desired. Inspections are regularly made of restaurants, bakeries, and grocery stores.

Sanitation.—General sanitary inspections are made chiefly as a result of citizen's complaints. Special measures directed against fly breeding deal with removal of stable manure, and no special measures are directed against mosquito breeding.

Public utilities.—The water supply owned by the city is derived from an infiltration gallery and is chlorinated. None of the 10 cubic centimeter samples of treated water showed *B. coli* present according to laboratory reports. Both combined and separate types of sewerage are employed and accommodated 75 per cent of the population. A small portion of sewage is treated by septic tanks and Imhoff tanks before the discharge of the effluent into the Des Moines River.

Public-health education.—The health commissioner utilizes the press in summarizing monthly activities of the health department, and delivers occasional lectures on subjects of sanitation and communicable disease control. Special exhibits have been prepared for use at the State fair.

Special comment.—Progress has been made since 1920 in the extension of school health supervision and of health center service. There is need for increased appropriation in order that activities in the protection of maternity and infancy may be extended, as well as the development of special clinic services. Gaseous fumigation as a means for control of communicable disease should be abandoned. Stimulus should be given to reporting of cases of tuberculosis and venereal diseases. A more complete medical examination should be provided for children of the parochial schools.

DETROIT, MICH.

Detroit is a city of 995,668 people¹⁷ (1920) of whom 66.3 per cent are native white, 28.5 per cent foreign born, and 5.2 per cent colored. The city occupies an area of 92.7 square miles, giving a population per square mile of 11,300. The total taxable valuation was \$1,460 per capita.

Administration.—The city is governed by a mayor and council. A board of health of four members is appointed by the mayor to serve for overlapping terms of four years each. It is required that two members shall be physicians, and two laymen. Four meetings are held monthly. The commissioner of health is appointed by the board of health to serve for a term governed by the pleasure of the board, at a salary of \$10,000. The commissioner's salary in 1920 was \$7,500. It is required that the commissioner of health be a physician with five years' experience, or a doctor of public health. The appointment and dismissal of subordinates properly rests with the commissioner, as does the fixing of salaries (with the approval of the board, the mayor, and the council), while the making of rules and regulations, the issuing of orders, the hearing of appeals from orders, the abatement of unsanitary conditions and the promulgation of special emergency regulations rest with the board of health and the commissioner of health. The organization of the department consists of six bureaus with full-time directors in charge who receive salaries in proportion to that of the commissioner.

Expenditures.—The total expenditure per capita by the municipality in 1923 was \$3.35, with \$1.08 expended for health work by other agencies. Of the former amount, \$1.71 per capita was expended by the health department, \$0.88 being for hospitals, leaving \$0.83 for health purposes proper. In 1920, \$1.25 per capita was expended, \$0.72 being for health services proper and \$0.53 for the administration of hospitals.

Vital statistics.—The collection and analysis of vital statistics are conducted by a special bureau of the health department. Deaths are classified by cause and age, and both births and deaths are classified by sex, nativity, and color. Reports are published weekly, monthly, and annually. Death certificates from communicable diseases are routinely checked against disease reports, and deaths under 1 year and stillbirths are checked against reported births and stillbirths. The probable percentage of births reported is 95 per cent; of deaths, 100 per cent; and of stillbirths, 90 per cent.

Communicable disease control.—Measures for the control of communicable disease correspond with standards of the American Public Health Association. The ratio of cases reported to the number of deaths annually is low for typhoid fever (3.2), for diphtheria (11.3), and for measles (54.0). A consulting diagnostic service is maintained and freely called upon by physicians. Case records are kept of the principal diseases and the data correlated with other epidemiological information, while spot maps and chronological charts are utilized. Forty per cent of the cases of typhoid, 50 per cent of the cases of diphtheria, 33 per cent of the cases of scarlet fever, and 75 per cent of the cases of smallpox are hospitalized.

Tuberculosis.—There were 1,003 deaths recorded with 2,380 cases reported. Four dispensaries, with 25 clinic periods per week provide diagnostic treatment service, 5,697 patients having made 22,983 clinic visits. Nurses made 28,664 visits to homes in behalf of tuberculosis cases. In the city's sanatoria, 500 beds are available for adults and 100 for children, while 190 additional

¹⁷ In 1925 a complete census of Detroit was made under Federal supervision with the result that the city is now accredited with a population of 1,242,044. On this basis an estimated population for 1923 is given as 1,050,000.

beds are available for adults and 25 for children in privately operated institutions. During the year 1,467 patients were admitted to these institutions. In addition to the home follow-up by nurses, 1,101 visits were made to patients' homes by physicians.

Venereal diseases.—State law and city ordinances require reporting by name and address to the health department, 2,839 cases of syphilis, 2,579 cases of gonorrhea, and 53 other cases having been reported. Two clinics are maintained for men, two for women, and one for children weekly. The total clinic registration, including those admitted for consultation and advice as well as those treated, numbered 14,879, 10,363 being adults and 569 being children who came for first visits. A total of 71,329 visits was made by gonorrhea patients, 31,685 by syphilis patients, and 21,162 by other venereal-disease patients. There were 1,807 cases returned to physicians or clinics after having stopped treatment, while 166 cases were isolated. Eight nurses are engaged in clinic work, and one in making home calls, 1,571 home visits having been made.

Child hygiene.—Eight prenatal clinics are maintained by the health department with 1,872 prenatal cases registered as having paid 11,587 visits to clinics, while 18,169 nurses' visits were made to prenatal cases. Of 28,168 live births, 32 per cent occurred in hospitals, while 226 births were attended by midwives supervised by the health department. A total of 5,767 children under 2 years of age are registered at the 13 infant welfare clinics of the health department, 24,104 visits having been made. Nurses' visits to homes of children of this age period numbered 63,600, in addition to 20,822 visits in behalf of children of ages two to five, inclusive. There are 6,565 preschool children who visited clinics, having made 20,828 visits. All maternity homes and child-welfare agencies are subject to inspection by the health department.

Health supervision of the children of the private, parochial, and public schools is exercised by the health department. A complete physical examination is made of children of the first and fifth grades and of selected underweight children, once a year. In all 70,738 examinations were made and 70,744 defects discovered during the year, while 17,057 defects were corrected during the same period. Children 17 years of age or under must pass a physical examination given by a physician of the board of health before receiving a working permit, 5,323 examinations having been made and 5,315 certificates issued during the year.

Mental hygiene.—There are three outpatient clinics in connection with the State psychopathic hospital. A court psychopathic clinic is also maintained, in addition to the clinic of the board of education and that of the juvenile division of the probate court. Facilities for mental examination of preschool children are provided at the Merrill-Palmer School.

Industrial hygiene.—The health department does not engage in this work. Extensive industrial hygiene activities are carried on by individual industrial concerns.

Public-health nursing.—A separate bureau of nursing is maintained with central supervision. In one-tenth of the city area, generalized nursing is pursued. There were 197 nurses provided by the health department, 1 by the board of education, 68 by the visiting nurses association, and 7 by other private agencies, giving a ratio of 26 nurses per 100,000 population.

Laboratory.—Bacteriological, serological, and chemical examinations are made routinely in the public-health laboratory in addition to special researches. A total of 128 diagnostic examinations per 1,000 population were made during the year.

Food.—Dairies producing milk for the city are inspected and scored regularly. Tuberculosis testing of all herds from which milk is sold raw is required. There are five dairies producing certified milk. Each milk plant is visited three times a week and 98 per cent of the supply was Pasteurized. The total milk consumption averaged 1 pint per person per day. Restaurants, bakeries, food factories, candy manufacturing establishments, and ice-cream plants are regularly inspected, 27,067 inspections having been made. Licenses are issued to restaurants, bakeries, candy and food manufacturing establishments. Physical examination of food handlers is required once a year.

Sanitation.—Inspections are made under the authority of the State housing code and local ordinances. The scope of activities includes all matters relative to housing, sanitation, and nuisances. A permanent record of all investigations is maintained. Swimming pools are supervised by inspectors and by laboratory examinations.

Public utilities.—The public-water supply is owned by the city and is derived from the Detroit River. Treatment is by filtration and chlorination. Over 99 per cent of the population was served. Both the combined and separate systems of sewerage are employed, the sewage being discharged untreated into the river. Ninety-five per cent of the population was accommodated. It was estimated that 5,000 privies were still in use, and these are regularly inspected by the health department.

Public-health education.—The secretary of the health department is in immediate charge of public health education work, which is well organized. Weekly and monthly bulletins are issued, the daily press is regularly utilized, each department has a health exhibit, and training courses are given nurses, teachers, and other groups. Lectures on general-health topics are frequently given.

Special comment.—Progress has been made since 1920 in extending the maternal and infant hygiene program and school-health work. There are still needed increased nursing service for early discovery and follow-up of tuberculosis cases, and extension of open-air rooms and preventoria. Nursing visits in behalf of infants and visits of infants to clinics are only half the standard suggested in the appraisal form for city-health work used by the Committee on Municipal Health Department Practice.

DULUTH, MINN.

Duluth is a residential city of 106,289 population, classified as 84.4 per cent native white, 15 per cent foreign born, and 0.6 per cent colored. The population per square mile is 1,660 persons. The total taxable valuation amounted to \$1,224 per capita.

Administration.—The form of municipal government consists of a commission with a mayor and council. The health department is a division in the department of public safety. The director of public health is appointed on a part-time basis by the commissioner at a salary of \$2,400.

Expenditures.—The expenditures of the health department amounted to \$0.85 per capita in 1923. The 1924 estimates were \$0.95 per capita, including \$0.55 for health purposes proper, \$0.24 for hospitals, and \$0.16 for garbage and refuse disposal. In 1920, \$0.84 per capita was expended, \$0.46 for health purposes, \$0.22½ for hospitals, and \$0.16 for garbage and refuse disposal.

Vital statistics.—Registration of vital statistics is conducted by the health department and certificates are checked or verified for their completeness. There are no published reports issued.

Communicable-disease control.—Reporting of communicable disease appears to be reasonably complete as judged from the ratio of cases to deaths recorded. In the main, measures for the control of communicable diseases correspond with accepted standards, and 86 per cent of the cases of typhoid, 50 per cent of the cases of diphtheria, 25 per cent of the cases of scarlet fever, and 40 per cent of the cases of smallpox are hospitalized. Approximately 50 per cent of the school children have been vaccinated against smallpox.

Tuberculosis.—There were 62 deaths from tuberculosis recorded, but the number of cases is not available, suggesting that the cases of this disease are not reported as early or as completely as would be desired. A total of 2,229 visits was made by nurses during the year in behalf of tuberculosis cases, while there were 2,285 clinic patients. At the county sanatorium there are available 160 beds for adults and 60 beds for children, while 274 patients were admitted during the year, 18 per cent being classified as in the incipient stage and 35 per cent in the moderately advanced stage of the disease. Cases are actively followed up in the homes and aftercare is given by nurses for an indefinite period.

Venereal diseases.—Reporting of venereal diseases in accordance with State and municipal law is by name and address to the local health department. There were 136 cases of syphilis, 545 cases of gonorrhea, and 4 other cases reported. A total of 7,466 visits was made to clinics during the year. There is one nurse connected with the local clinic and one social-service worker.

Child hygiene.—One nurse is maintained by the health department for child-hygiene work, her activities being devoted largely to prenatal service. Midwives are licensed by the State, but only 1.5 per cent of the births were attended by midwives during the year. There are 5 infant-welfare clinics maintained by voluntary agencies, which registered 869 babies, who made a total of 5,090 visits to clinics during the year. Health supervision of children of the public schools is carried on by the board of education, a part-time physician being in charge of the work. There is an average of 1 nurse for 2,500 pupils. A complete physical examination is made by physicians of all children through the sixth grade, while special examinations are given children in the high grades up to the junior high school. A total of 7,474 children were examined during the year (averaging a total attendance of 17,560), and 10,612 defects found. A total of 5,821 defects were corrected. A physical examination is required of children applying for working papers. Rooms are provided in schools for educationally exceptional children.

Industrial hygiene.—The only industrial hygiene work carried on locally is that of individual concerns.

Public-health nursing.—Four nurses were employed by the health department, 8 by the board of education, and 3 by voluntary agencies for service in well-baby clinics, giving a ratio of 14.1 nurses per 100,000 population.

Laboratory.—No public-health laboratory is maintained by the local health department, but a branch State laboratory is centrally located in the city. In this laboratory there were made during the year 15,599 examinations of disease specimens.

Food.—Dairies producing milk for the city are inspected quarterly, and are scored by the inspector and veterinarian of the department. Tuberculin tests of dairy herds are required before a license is issued for the sale of milk, and annually thereafter. Forty per cent of the milk supply was Pasteurized. The total milk consumption amounted to 0.9 pint per capita daily. Food stores and eating places are regularly inspected.

Sanitation.—Special sanitary inspectors are employed for routine house-to-house inspections monthly and for follow up of nuisance complaints. Housing inspection is a function of the health department, as is the collection and disposal of garbage and refuse. Incineration is used as a means of garbage and refuse disposal.

Public utilities.—The water supply owned by the city is derived from Lake Superior and is treated by chlorination before being served to 95 per cent of the population. It was stated that none of the 1 or 10 cubic centimeter samples of treated water showed *B. coli* present. Both the combined and separate systems of sewerage are employed and accommodated 90 per cent of the population, the sewage being discharged untreated into the St. Louis River, Duluth Harbor, and Lake Superior. There were approximately 1,200 privy vaults still in use in the outlying districts of the city.

Public-health education.—There is no special organization for health education. The health officer utilizes the press for occasional articles on health subjects and for the publication of milk records.

Special comment.—Progress has evidently been made since 1920 in the control of tuberculosis. The health appropriation should be increased to provide for full-time medical health officer services and for an additional nursing staff. Reporting of venereal diseases by private practitioners should be stimulated. The program for maternity and infant welfare should be extended under the auspices of the health department, and school health supervision should be provided for children of the parochial schools. The Pasteurization of milk should be required and the Pasteurization process defined in the sanitary code.

ELIZABETH, N. J.

The population of Elizabeth was 104,090, classified as 72.4 per cent native white, 20 per cent foreign born, and 7.6 per cent colored. An area of 10 square miles is occupied, giving a population per square mile of 10,409. The taxable valuation was \$1,031, which is one of the lowest figures for cities of this group.

Administration.—A mayor and city council govern the city, the mayor appointing the board of health of seven members for terms of four years. No qualifications for membership are prescribed, but three members are physicians. The health officer is a full-time executive with a salary of \$3,500. He must have a State license as health officer, and his position is under civil service. The appointment and dismissal of subordinates, the making of rules and regulations, and the hearing of appeals from orders are duties of the board, who also fix salaries subject to the approval of the budget by the city council.

Expenditures.—The per capita expenditures by the health department in 1923 were \$0.59, but only \$0.40 of this (\$0.37 in 1920) was for health service, \$0.14 being for hospitals, \$0.03 for plumbing, and \$0.02 for dog catcher. Of the total expenditures 72 per cent was for salaries.

Vital statistics.—Registration is conducted by the city clerk, but reports are daily transcribed into health department books. Certificates are checked and found to be 98 per cent complete for births and 100 per cent for deaths.

Communicable disease control.—Completeness of reporting of communicable diseases is above the average. Two negative cultures on successive days are required before release of diphtheria cases, but no special provision is made to obtain cultures from typhoid convalescents. Typhoid patients are hospitalized (60 per cent) in three general hospitals, while other acute communicable diseases are handled in the isolation hospital, which has 75 to 100 beds available, and admitted 106 cases. The school children are vaccinated to the extent of 99 per cent.

Tuberculosis.—There were 123 cases reported with 50 deaths. During the year 389 cases were admitted to the city hospital, 145 of them being later transferred to State and county institutions, where from 250 to 300 beds are available, while 57 other cases were admitted to the preventoria. One monthly evening clinic and two weekly day clinics are held at the Elizabeth General Hospital under the direction of the superintendent of the county sanatorium. Three social workers are employed by the antituberculosis association for this work.

Venereal diseases.—Reporting according to State law is by name and address, private cases being reported to the State and clinic cases to the local department. One hundred cases of syphilis and 90 cases of gonorrhea were recorded. Five weekly clinic sessions are held in two local hospitals for diagnosis and treatment, where 122 cases of syphilis and 90 cases of gonorrhea were treated. A venereal disease nurse employed by the health department made 822 visits to homes.

Child hygiene.—A general child-welfare clinic is held weekly in each of 7 districts of the city, where 1,160 babies were registered, with an attendance of 9,416. Home visits by the 8 health department nurses totaled 17,300. The number of expectant mothers registered at clinics and under nursing supervision is stated to be 225. Of the 2,247 live births, approximately 50 per cent were delivered by midwives, 22 of whom are licensed and under the supervision of the State board of medical examiners. Two part-time physicians and 2 nurses are employed by the health department for health supervision of the 5,500 children enrolled in the 11 parochial schools. A staff is employed by the board of education consisting of a medical inspector, a dentist, 2 oculists, and 6 nurses (in addition to part-time nursing supervision furnished by the supervisor of the visiting nurse association). The program includes a complete physical examination, without removal of clothing, of each child annually by physicians assisted by the nurses. A new system of continuous records has been instituted to show results of defects found and corrected as well as other pertinent information. Children applying for working papers must be physically examined by a school physician. There are no organized activities in the field of mental hygiene.

Industrial hygiene.—This work is handled by the State department of labor.

Public-health nursing.—There is no separate nursing bureau in the health department and no central nursing supervision, except between the visiting nurse association and the board of education nurses. The nursing staff of the health department numbered 11, that of the school board 6, of the visiting nurse association 6, with an additional nurse to supervise the work of the two latter organizations, giving a ratio of 23.0 per 100,000 population.

Laboratory.—Routine laboratory work included 162 chemical and bacteriological examinations of water and 1,166 of milk. The diagnostic examinations per 1,000 population numbered 29, Wassermann specimens being sent to the State laboratory.

Food.—Dairy inspections numbered 92, in addition to annual inspections of the 16 Pasteurization plants, where 88 per cent of the milk supply was Pasteurized. Efficiency of plants is checked by periodic laboratory examinations. Tuberculin testing is required of herds producing milk to be sold raw. The per capita consumption was 0.7 pint daily, a figure 30 per cent below the desired amount. The food and dairy inspector also inspects markets, bakeries, bottling plants, and food depots. During the year physical examinations were made of 135 restaurant employees for the detection of communicable diseases.

Sanitation.—General sanitary inspections are made as result of complaints for the abatement of nuisances, and house-to-house inspections in certain districts are made annually. Plumbing inspection is still handled by the health department. Special regulations require storage of stable manure in tight bins above ground, with weekly removal during the summer months. Active measures are directed against mosquito-breeding areas by a county commissioner.

Public utilities.—The water supplied to over 99 per cent of the population comes from surface sources and deep wells, privately operated. Treatment is by rapid sand filtration and chlorination. The combined sewerage system provided for 98.5 per cent of the population, the untreated sewage being discharged eventually into Staten Island Sound. Privy vaults were being abandoned as rapidly as sewer connection may be made; 100 vaults, not necessarily screened, were still in use.

Public-health education.—Lectures before civic clubs are delivered by the health officer, who also utilizes the daily press.

Special comment.—Increased appropriation is necessary for the development of adequate health service for Elizabeth, covering antituberculosis and venereal-disease work, as well as increased nursing and child-hygiene activities. The release of typhoid-fever cases should be based upon bacteriological evidence. More complete supervision of the milk supply is indicated as desirable.

EL PASO, TEX.

El Paso is a city of 96,319 people, of whom 55.3 per cent are native white, 43 per cent foreign born, and 1.7 per cent colored. The city occupies an area of 16.5 square miles, giving a population per square mile of 5,538. The taxable valuation amounted to \$1,048 per capita.

Administration.—The city is governed by a mayor and 4 aldermen. A board of health of 3 members is appointed by the mayor to serve for a 2-year term, 2 of the members being physicians, and the third, the mayor. The health officer is secretary of the board of health. The health officer is appointed by the mayor for a term of 2 years at a salary of \$5,000.

Expenditures.—The total expenditures by the health department in 1923 amounted to \$0.98 per capita, \$0.15 of which was for hospitals, \$0.20 for mosquito control, and \$0.02 for medical relief of the sick poor.

Vital statistics.—The registration of vital statistics is in accordance with State law, reports being received by the health department and certificates of births and deaths regularly checked and verified.

Communicable-disease control.—Reporting of the principal communicable diseases is apparently incomplete as judged by the fact that only 4.6 cases of typhoid per death, 7 cases of diphtheria per death, 33 cases of measles, and 13 cases of whooping cough per death were reported. A total of 78 cases of scarlet fever for each death was reported. There are 52 hospital beds available for communicable-disease cases. Gaseous fumigation is still practiced after cases of smallpox. It is reported that all the school children have been vaccinated.

Tuberculosis.—There were 608 cases of tuberculosis reported with 413 deaths. A total of 234 clinic patients made 1,155 visits to clinics, while 966 nurses visits were made in behalf of tuberculosis cases.

Venereal diseases.—Reporting, in accordance with State law, is by office number to the local health department, there having been 339 cases of syphilis, 182 cases of gonorrhea, and 24 other cases reported. One clinic is provided where 359 cases of syphilis, 195 cases of gonorrhea, and 39 other cases were treated.

Child hygiene.—Of the 2,649 live births, 50 per cent were attended by midwives who are registered and closely supervised by the health department. A total of 413 births occurred in hospitals. One prenatal clinic is conducted by the health department, with a part-time physician in attendance. There are two infant-welfare clinics conducted by the health department, which were attended by 2,183 preschool children who made 9,687 visits, while 2,494 nursing visits were made to homes. Health supervision of children of the public and parochial schools is carried on by the health department, there being provided one nurse for each 3,000 children. A preliminary physical inspection of children of the first five grades is made annually by nurses, who select children with obvious defects for special examination by physicians. Under the State law a child must attend school until 14 years of age. No physical examination is required of children applying for working papers. There are no special industrial hygiene activities, and no special activities for the promotion of mental health.

Public-health nursing.—There were 8 nurses employed by the department of health, 6 nurses employed by the department of education, and 1 nurse employed by other agencies.

Laboratory.—Public-health laboratory work is handled by contract, a total of 8,532 examinations having been made during the year.

Food and sanitation.—There are 234 dairies producing milk for the city. These are inspected and scored, 779 such inspections having been made. All cattle are required to be tuberculin tested, and 60 per cent of the milk supply was pasteurized. The total per capita consumption of milk amounted to 0.9 pint daily. Food inspections are regularly made and licenses issued. General sanitary inspections are made chiefly as a result of complaints.

Public utilities.—The public water supply owned by the city is obtained from drilled wells and served to 99.7 per cent of the population. Laboratory analyses showed *B. coli* present in 5 per cent of the 10 cubic centimeter samples. The separate system of sewerage is employed, and was used by 95 per cent of the population. The sewage is treated by Imhoff tanks, the effluent being discharged into the Rio Grande River.

Public-health education.—The health officer publishes monthly bulletins, prepares special articles for the daily papers, and delivers occasional lectures on general health topics. Exhibits have been prepared illustrating industrial hygiene and tuberculosis problems.

Special comment.—The health department of El Paso was reorganized in 1922 and is now apparently developing a sound program of health promotion. Increased provision should be made for protection of maternity and infancy through increased appropriations to provide for a larger medical and nursing staff. Antituberculosis work should be extended.

ERIE, PA.

Erie is a city of 112,571 people, 80.2 per cent of whom are native white, 19 per cent foreign born, and 0.8 per cent colored. The population per square mile was 5,492. The total taxable valuation amounted to \$1,021 per capita.

Administration.—The form of municipal organization consists of a commission. There is a board of health of 5 members appointed by the mayor for 5-year terms. It is required that 3 of these members be physicians. Meetings are held monthly or oftener. The health officer is appointed on a part-time basis by the council at a salary of \$2,860 a year. The appointment and dismissal of subordinates and the fixing of salaries are functions of the city council, while the making of rules and regulations is a duty of the board of health.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.40 per capita, \$0.07 being for hospitals, and \$0.06 for plumbing inspections. In 1920, \$0.65 per capita were expended, \$0.40 being devoted to health purposes proper.

Vital statistics.—Registration of vital statistics is conducted by the health officer. Birth and death certificates are regularly checked for completeness, and it is considered probable that 99 per cent of the births and 100 per cent of the deaths are reported.

Communicable-disease control.—Fifty per cent each of the cases of diphtheria and scarlet fever and 100 per cent of the cases of smallpox are hospitalized. Gaseous disinfection is still practiced after cases of scarlet fever and smallpox. The period of isolation for cases of scarlet fever, smallpox, and whooping cough is 30 days, and for measles cases 16 days. Ninety-five per cent of the school children have been vaccinated against smallpox.

Tuberculosis.—There were 254 cases with 88 deaths reported. The State holds two clinics a week for the diagnosis of tuberculosis. Nursing visits in behalf of tuberculosis cases numbered 817, while 324 clinic patients were on active records as having been seen within the year. A total of 1,231 clinic visits was made.

Venereal diseases.—There were 243 cases of syphilis and 203 cases of gonorrhea reported by office number in accordance with State and municipal regulations. The State maintains a venereal-disease clinic, where 200 cases of syphilis and 175 cases of gonorrhea were treated. Social-service work is carried out under the auspices of a committee of 16, one social-service worker being employed. This committee also cooperates in the maintenance of the venereal-disease clinic, which is open three afternoons a week.

Child hygiene.—Prenatal activities are confined to the work of visiting nurses. Midwives, who attended 23 per cent of all births, are licensed by the State and registered by the city health department. Four infant-welfare clinics are conducted by the visiting-nurse association, and 741 visits were made to clinics by children under 2 years of age, while there were 132 visits by children of ages 2 to 5. Nurses' visits in behalf of infants numbered 2,656. Health supervision of children of the public and parochial schools is carried on by the board of education, a full-time medical inspector being employed. An annual physical examination is given children of all grades, 18,890 examinations having been made of children of the public schools, and 6,100 examinations of children of parochial schools. Among children of the public schools there were discovered 14,484 defects, while 7,560 defects were corrected. Among parochial-school children there were 6,365 defects discovered and 1,692 defects corrected. Children applying for working papers are required to pass a physical examination given by the medical examiner of the board of education, and a total of 1,037 certificates was issued during the year. The State conducts a mental clinic once a month in cooperation with the board of education.

Industrial hygiene.—There are no activities in this field by the city health department.

Public-health nursing.—Eight nurses were employed by the board of education, 2 by the health department, and 15 nurses by the visiting-nurse association, giving a ratio of 22.2 nurses per 100,000 population.

Laboratory.—A total of 3,596 examinations was made for diphtheria, and 29 for tuberculosis, in addition to 982 bacteriological milk examinations and 2 miscellaneous examinations.

Food and sanitation.—The 1,634 producing dairies are inspected once a year and scored. Tuberculin testing of herds from which raw milk is sold is

required, 90 per cent of the milk supply being Pasteurized. A semiannual physical examination is required made of food handlers by private physicians, 6,236 such examinations having been made during the year. Food stores and markets are inspected and scored. General sanitary inspections are made chiefly as a result of citizens' complaints. Plumbing inspection is still considered a function of the health department. Special measures are directed against fly and mosquito breeding.

Public utilities.—The public water supply owned by the city is derived from Lake Erie and is treated by rapid sand filtration and chlorination before being served to over 99 per cent of the population. Laboratory analyses of 1 cubic centimeter samples of treated water showed *B. coli* absent. Both combined and separate systems of sewerage are employed, the sewage being discharged into the bay and lake.

Public-health education.—The health officer publishes an annual report of 400 copies, utilizes the press about once a week, and delivers occasional lectures on health and sanitation before church and civic clubs. Child welfare and tuberculosis exhibits have been prepared for use at the county fair.

Special comment.—Progress has been made since 1920 in extending the child-welfare program and in securing increased Pasteurization of milk. There is still needed a considerable increase in the health appropriation to provide for full-time medical health officer service and for an increased medical and nursing staff. Stimulus should be given to more prompt reporting of communicable diseases, particularly typhoid, and measures for the control of communicable diseases should be made to conform more closely to the standards accepted by the American Public Health Association. Additional hospital beds are needed for the care of acute cases of communicable diseases and for tuberculosis.

EVANSVILLE, IND.

Evansville is largely a residential city of 90,567 population distributed over an area of 9.5 square miles, giving a population of 9,533 per square mile. The city is governed by a mayor and council. A paid board of health and charities of 3 physicians is appointed by the mayor for terms of 4 years, the secretary serving as health officer on a part-time basis at a salary of \$1,500. Most of the administrative work is handled by the chief sanitary officer, however, whose salary is \$1,800. The total health-department appropriation in 1923 amounted to \$0.43 per capita, only \$0.27 of which was for strictly health purposes, \$0.03 for hospitals, and \$0.13 for poor relief.

Reporting of all communicable diseases is evidently incomplete, control measures are limited, there are no facilities for hospitalization except for smallpox and tuberculosis cases, and gaseous fumigation is still practiced. A venereal-disease clinic is operated daily by the State and the United States Public Health Service, 390 cases of syphilis, 407 cases of gonorrhea, and 14 other cases having been treated.

The babies' milk fund association and the visiting nurses' circle provide nursing care for expectant mothers and infants. Well-baby clinics are operated in three sections of the city, with paid medical service provided by private agencies. In all, 2,020 babies were registered as having made 4,544 clinic visits, while home-nursing visits of an infant-welfare character numbered 17,332. A fairly complete program is carried out for school-health supervision of the 13,453 children enrolled in public schools, with 2 nurses and a dentist provided by the health department, and 2 nurses and 7 part-time physicians employed by the board of education. A total of 8,921 physical examinations was reported, but records of defects corrected are not available.

A limited number of bacteriological examinations are performed in local hospital laboratories on a contract basis. Tuberculin testing of 97 per cent of the cows producing milk sold in the city is reported, while 80 per cent of the supply was Pasteurized.

The public water supply is owned by the city and is derived from the Ohio River. After rapid sand filtration and chlorination the water was supplied to 90 per cent of the people, the remainder using private wells, of which there were about 200. A combined sewerage system served 60 per cent of the population, the untreated sewage being discharged into the river. There were 1,700 privy vaults, although not all of this number were in use. A chief sanitary officer, and 4 sanitary police paid by the police department make general sanitary inspections, chiefly for the abatement of nuisances.

Special comment.—The health department appropriation is entirely inadequate to provide even for what is considered to be a minimum of health machinery needed in a community of this size. There is need for a full-time medical health officer, aided by a staff of trained workers, to perform the various activities recognized as essential for disease control and health promotion. Standards of the American Public Health Association should be adopted for the control of communicable disease, and provision should be made for hospitalization of cases which can not be properly cared for at home. A community of this size should assume responsibility for prenatal and child-hygiene work under official auspices and should safeguard the milk supply by systematic supervision from the source until it is delivered.

FALL RIVER, MASS.

Fall River is an industrial city with a population of 120,912, classified as 64.5 per cent native white, 35 per cent foreign born, and 0.5 per cent colored. The city occupies an area of 40.9 square miles, giving a density per square mile of 2,956. The taxable valuation was \$1,556 per capita.

Administration.—A mayor and board of aldermen govern the city. A paid board of health of three members is appointed by the mayor for a term of three years, one being replaced each year. This board exercises general oversight and control in health affairs. Their duties include the appointment and dismissal of subordinates, the making of rules and regulations, the hearing of appeals from orders, and the abatement of insanitary conditions, while salaries are fixed by the board with the approval of the mayor. An agent of the board is appointed by that body at a salary of \$3,600 to serve during good behavior under civil service. The present agent of the board has been in office 33 years.

Expenditures.—The total expenditure of the health department in 1923 was \$1.24 per capita, including \$0.02 for plumbing inspection and \$0.30 for care of patients at the sanatorium. In 1920, \$0.89 per capita were expended, \$0.37 being devoted to health purposes and \$0.52 to hospital service.

Vital statistics.—The collection of vital statistics is conducted by the city clerk, who makes returns directly to the secretary of state, under whose jurisdiction this work is performed in Massachusetts. Both birth and death certificates are checked and verified for completeness and accuracy, and weekly reports are made to the press, while monthly tabulations are published.

Communicable-disease control.—Reporting of communicable diseases is still lower than the desired standard of completeness, as shown by the fact that only 6 cases per death from typhoid, 12 cases per death from diphtheria, 56 cases per death from scarlet fever, 20 cases per death from measles, and 11 cases per death from whooping cough are thus recorded in the health depart-

ment. There are 29 hospital beds for communicable-disease cases per 100,000 population. About 85 per cent of the school children have been vaccinated against smallpox.

Tuberculosis.—There were 259 cases with 143 deaths reported, or an average of less than 2 cases per death, which is a little less than half the number which might be expected if reporting were fairly complete. Facilities for diagnosis and treatment are provided at the dispensary where 679 visits were made by 509 patients, while a total of 5,479 nursing visits were made by the 2 tuberculosis nurses of the health department, and the 18 nurses of the district nurse association who give part-time service to the work. There were 150 patients admitted to city, county, and State institutions during the year.

Venereal diseases.—There were 37 cases of syphilis and 103 cases of gonorrhea reported by office number to the State department.¹⁸ One clinic is maintained to which 5,857 visits were paid by 327 patients.

Child hygiene.—Of 3,688 live births, 25 per cent were attended by midwives who are not licensed or supervised, while 17 per cent occurred in hospitals. There were 649 expectant mothers registered as under care of the maternal and infant welfare commission and the district nurses, 209 visits having been made to clinics with 1,176 nursing visits to homes. There were 1,102 children under 2 years of age who paid 10,544 visits to the 8 clinics of the health department and the district nurse association, while 9,578 nurses' visits were made to homes. School health supervision in both public and parochial schools is under the board of health, a full-time medical director being employed.¹⁹ All children from kindergarten through the eighth grade are examined once a year, 23,472 children having been examined in 1923. Children applying for working papers must pass a physical examination given by any physician, usually a school medical examiner, before being issued a certificate. The State cooperates with the city in providing special clinics for the examination of retarded children, and special classes are held for school children who are found to be backward.

Industrial hygiene.—There are no special activities, by the city, in industrial hygiene.

Public-health nursing.—A total of 18 nurses was provided by the health department and 28 by voluntary agencies, giving a ratio of 38 nurses per 100,000 population, whose work is carried out according to the specialized plan.

Laboratory.—There were 4,306 bacteriological and chemical examinations of milk samples, 728 examinations of diphtheria cultures, 542 of tuberculosis, and 450 of gonorrhea smears, with 171 widals, and 2,112 complete urinalyses.

Food.—Inspection of dairy farms is made annually. Herds from which raw milk is sold are tuberculin tested and regulations of the board of health prohibit the addition of cattle to these herds before the test has been applied. Fifty per cent of the milk supply was Pasteurized. The per capita consumption of milk amounted to 0.8 pint daily. Regular inspections are made of all establishments handling foods and of methods employed. Special attention is given to sterilization of utensils.

Sanitation.—General sanitary inspections for the abatement of nuisances are made chiefly as a result of citizens' complaints. Although plumbing inspection is under the health department, the appropriation for this work is not charged to health department funds. Special regulations exist for the prevention of fly breeding.

¹⁸ Beginning October 1, 1924, reports were also made directly to the city board of health office.

¹⁹ At present (1925) the medical director is assisted by eight part-time physicians, a supervisor, and nine school nurses.

Public utilities.—All the people are served by the public water supply owned by the city. The water is derived from a natural lake and receives no treatment other than storage. Laboratory supervision is maintained by the State department of public health. The sewage system is principally of the combined type, the untreated sewage being discharged into the bay. Records are not available as to the population accommodated, or as to the number of privies still in use.

Special comment.—Considerable progress has been made since 1920 in providing increased care for maternity and infancy, in the development of a comprehensive program of school health supervision, and in the revision of milk regulations. Increased appropriations are necessary for additional nurses, while increased facilities should be provided for the control of venereal diseases and the development of mental hygiene work. Pasteurization of milk should be encouraged.

FLINT, MICH.

Flint is an industrial city with a population of 117,968, classified as 77 per cent native white, 20 per cent foreign born, and 3 per cent colored. The population per square mile was 4,611 and the taxable valuation was \$1,155 per capita.

Administration.—A mayor and council govern the city. A board of health of 3 members, including the health officer, is appointed by the mayor, with confirmation by council, for a term of 2 years (overlapping terms), to exercise general supervision, determine policies, and pass on health department expenditures. Weekly meetings are held. The health officer is appointed by council on a full-time basis at a salary of \$5,000 plus \$600 for automobile maintenance. He is given broad administrative powers.

Expenditures.—The total health department expenditures in 1923 amounted to \$0.65 per capita all of which was for health purposes proper, except \$0.07 for plumbing. In 1920, \$0.88 per capita were expended.

Vital statistics.—Registration of vital statistics is conducted by the health officer and conforms to modern procedure, at least 95 per cent of the births and 100 per cent of the deaths being reported, as determined by checks of completeness.

Communicable-disease control.—Reporting of the principal communicable diseases is quite complete, although the ratio of cases to deaths of typhoid (6 to 1) and of diphtheria (10 to 1) is low. On the other hand, 258 cases of measles and 178 cases of whooping cough for each death were reported. Spot maps and chronological charts are utilized. Hospitalization of communicable-disease cases is well carried out for the small proportion of beds available. Control practices conform to standards of the American Public Health Association.

Tuberculosis.—There were 195 cases with 42 deaths. One clinic is held each week, while home-nursing visits numbered 1,344. Hospital provision is made at State and county sanatoria.

Venereal diseases.—Reporting is by name and address to the State health department, 288 cases of syphilis and 117 cases of gonorrhea having been reported, while 367 cases of syphilis and 130 cases of gonorrhea were treated at the clinics open daily, including one evening. One social-service worker nurse is employed.

Child hygiene.—Of the 3,178 live births, 127 were attended by midwives and 17 occurred in hospitals. The health officer conducts a prenatal clinic, which was attended by 61 patients, and 902 children under 2 years of age attended

the 6 infant-welfare clinics, making 2,733 visits. Nursing visits to homes numbered 7,395, with 2,465 visits by physicians in behalf of infants. Children of the parochial schools are supervised by the health department, while those of public schools are under the care of the board of education, there being an average of 1 nurse to 1,680 pupils. In both the public and parochial schools a complete physical examination is given to all children once a year. There were 3,440 examinations of children of the parochial schools, with 2,658 defects found and 181 corrected by clinics in addition to those corrected by private physicians. Regular examinations of children applying for working papers are not made. There is no special activity for the promotion of mental hygiene.

Industrial hygiene.—There is no activity in this field by the health department.

Public-health nursing.—There is a separate division of nursing with central supervision. Nine nurses were provided by the health department and 10 by the board of education, giving a ratio of 16.3 per 100,000 population.

Laboratory.—The usual free bacteriological and chemical laboratory service is provided, 80 diagnostic examinations per 1,000 population having been made.

Food and sanitation.—Systematic supervision is exercised over milk and food supplies. Dairies are inspected and scored, herds from which raw milk is sold are tuberculin tested, and 85 per cent of the milk supply was Pasteurized. The per capita milk consumption amounted to 0.5 pint daily. Routine house-to-house inspections are made on the initiative of the department of health as well as after complaints. Plumbing is still handled by this department.

Public utilities.—The public water supply owned by the city is derived from the river and treated by coagulation, sedimentation, filtration, and chlorination before being served to 82 per cent of the people. Laboratory tests of treated water showed *B. coli* present in 9.6 per cent of the 10 cubic centimeter samples. The separate system of sewerage is employed, and accommodated 80 per cent of the population. Plans are under way for a sewage-treatment plant.

Public-health education.—The health officer publishes bulletins, utilizes the daily press, delivers frequent lectures on general health topics, and has a general hygiene exhibit. Lectures are given weekly to nurses.

Special comment.—Flint has a well-organized health department for a city of its size, but there are needed increased funds for the extension of certain of its services, as the maternal and infant hygiene program and antituberculosis work. Increased number of beds is needed for communicable-disease cases. Special efforts might well be directed for increased consumption of milk. More consideration should be given to the follow-up of children of the public schools to secure correction of defects and continuous records should be kept.

FORT WAYNE, IND.

The population of Fort Wayne was 93,673, classified as 90 per cent native white, 7 per cent foreign born, and 3 per cent colored. The city occupies an area of 16 square miles, giving a population per square mile of 5,855. The taxable valuation was \$1,842 per capita.

Administration.—The city is governed by a mayor and council. There is a board of health of 3 members appointed by the mayor for terms of 4 years, 2 of whom must be physicians, and not more than 2 members of the same political faith. Meetings are held monthly. The health officer is appointed by the mayor on a part-time basis, at a salary of \$1,500, for a term of 4 years. The position is not under civil service, but the candidate's appointment must be approved by the State board of health. The provision for appointments and

dismissals of subordinates, making rules and regulations and issuing orders, are given to the health officer, while salaries are fixed by the city council.

Expenditures.—The per capita expenditure of the health department in 1923 was \$0.26, all of which is spent for health purposes.

Vital statistics.—Registration of vital statistics is conducted by the health officer, and certificates are regularly checked, with the result that 95 per cent of the births and 100 per cent of the deaths are reported.

Communicable-disease control.—Reporting of communicable diseases seems to be quite complete except for typhoid, the ratio of cases per death of 7.3 falling short of the desired standard of 10. Routine procedures for the control of various communicable diseases conform in general to accepted standards, except for the continuation of gaseous fumigation after cases of diphtheria, scarlet fever, and smallpox, and for the release of typhoid cases from isolation without first securing negative cultures. Only 15 per cent of the school children of the first grade are reported to have been vaccinated.

Tuberculosis.—A total of 53 deaths with only 43 cases reported is an indication of incomplete reporting of this disease. No information is available as to the nursing visits in behalf of tuberculosis cases, but it is said that 455 patients are on the active records at the clinic provided at the county tuberculosis hospital. This institution also has facilities for hospitalization of 150 patients from Fort Wayne.

Venereal disease.—Reporting of cases according to State and municipal regulations is by name and address and also by office number to the local health department. A total of 73 cases of syphilis, 129 cases of gonorrhea, and 5 other cases was reported. At the clinic provided by the health department a total of 536 cases of syphilis, 952 cases of gonorrhea, and 34 other cases was reported treated. Twenty-six cases were hospitalized in private institutions.

Child hygiene.—There is no provision made by the health department for prenatal and infant-welfare service. Prenatal instructions are given by the visiting nurse league, 306 visits having been made to 70 patients in 1923. There were also 200 babies under care who received 1,178 nursing visits. During the year 598 infants and children of preschool age were examined by State authorities and received follow-up and correctional work by the visiting nurse league. Health supervision of the 13,126 children enrolled in the 23 public schools is provided by the board of education, with a staff of 1 part-time physician and 2 nurses. A complete physical examination of children from the kindergarten to the eighth grade is given annually to acquaint parents with the physical defects in their children and to encourage corrections. A total of 5,415 defects was recorded, with 1,502 corrections during the year. The school examination records, continuing until the end of the eighth grade, offer the information usually demanded by the regulations when working papers are issued.

Mental hygiene.—Special provision for mental examinations is offered at the Indiana school for feeble-minded, which is a State institution located in the city. A clinic day is maintained each week.

Industrial hygiene.—Each large industry has its own staff of physicians and nurses, but otherwise nothing is done locally.

Public-health nursing.—The only public-health nursing in Fort Wayne is performed by the Red Cross, the visiting nurse league, and the two nurses employed by the board of education; in all, 10.7 nurses per 100,000 population being provided.

Laboratory.—A public-health laboratory is maintained which provides for milk and water analyses and for a limited amount of diagnostic work, 10

diagnostic examinations per 1,000 population having been made during the year.

Food.—The 1,300 dairy farms producing milk for the city are inspected twice a year and tuberculin testing of all herds producing milk which is to be sold raw is required. It was stated that 98 per cent of the whole supply was Pasteurized, the total per capita consumption amounting to 0.6 pint. General inspection of food establishments is required. Physical examinations of food handlers are made by private physicians. The limited force for meat inspection makes possible only a sanitary inspection of slaughterhouses other than those federally inspected.

Sanitation.—General sanitary inspections are made by the health department staff and by the chief sanitary officer and five sanitary police. Special activities have been directed toward elimination of privy vaults and the connection of houses with water-carriage systems. Routine house-to-house inspections are made for the discovery and correction of nuisances in addition to the usual follow up as a result of complaints. Measures against flies include a regulation that manure must be kept in fly-proof receptacles and removed twice weekly during the summer months.

Public utilities.—The water supply owned by the city served 85 per cent of the population with water from wells which is untreated. Laboratory supervision is maintained by the board of health. The combined system of sewerage is employed and was accessible to 95 per cent of the population, the sewage being discharged raw into the St. Mary and St. Joe Rivers.

Public-health education.—There is no organized campaign of public-health education.

Special comment.—The health machinery of the health department is entirely inadequate to provide for a modern health program in a city of the size of Fort Wayne. A city of 100,000 population needs the services of a full-time medical health officer at an adequate salary. The need for increased personnel to provide for care of mothers and children in Fort Wayne, in addition to an active nursing organization in the health department, is indicated. There should be an organized campaign of public-health education.

FORT WORTH, TEX.

Fort Worth is a city of 143,821 people, classified as 78.2 per cent native white, 6.9 per cent foreign born, and 14.9 per cent colored. An area of 39.8 square miles is occupied, giving a population per square mile of 3,614. The taxable valuation was \$915 per capita.

Administration.—The city is governed by a mayor and commission. There is a board of health of 11 members appointed by the mayor and commission for a term of two years to act in an advisory capacity to the health officer. The appointment and dismissal of subordinates, fixing of salaries, making of rules and regulations rest with the commission. The health officer is appointed on a part-time basis by the mayor and commission for a term of two years at a salary of \$1,500. The office is not under civil service. It is required that the health officer be a physician with six months' residence in the city.

Expenditures.—The total expenditures by the city government for health purposes in 1923 amounted to \$0.26 per capita, but only \$0.13 of this was spent by the health department. In 1920 the expenditures of the health department amounted to \$0.35, \$0.25 being for health purposes and \$0.10 for hospital service.

Vital statistics.—The collection and classification of vital statistics are conducted by the health department. The city is in the registration area for

deaths but not for births. Both birth and death certificates are checked for completeness and accuracy, but no vital statistics report is issued.

Communicable-disease control.—Reporting of cases of typhoid fever is apparently incomplete as shown by the fact that only 4.6 cases per death are reported, as compared with the minimum standard of 10. With the exception of whooping cough, there being an average of only 1.5 cases per death reported, reporting of the other principal communicable diseases is satisfactory. There are 16 hospital beds for communicable-disease cases per 100,000 population. The period of isolation of measles is 21 days, and gaseous fumigation is practiced after cases of diphtheria, scarlet fever, smallpox, chicken pox, cerebrospinal meningitis, and acute anterior poliomyelitis. It is estimated that 40 per cent of the school children have been vaccinated.

Tuberculosis.—There were 70 cases of tuberculosis with 40 deaths reported. A clinic is maintained at the city-county hospital, and 121 patients were on the active records during the year as having made 195 visits. A total of 1,808 nursing visits in behalf of tuberculosis cases was made. There are 20 beds at the city-county hospital and 65 patients were admitted during the year, no provision being made for hospitalization of negro cases.

Venereal diseases.—There were 171 cases of syphilis, 76 cases of gonorrhea, and 14 other cases reported, in most cases by office number to the health department. A venereal-disease clinic under the control of the county is maintained at the city-county hospital, where 119 cases of syphilis and 37 cases of gonorrhea received treatment. No provisions are made for hospitalization, with the exception of the babies' hospital.

Child hygiene.—There is no official machinery in Fort Worth for the care of maternity and infancy. The infant-welfare nurses made 438 visits to prenatal cases and 383 visits to obstetrical cases, while 110 visits were made in connection with problems of infant welfare. Health supervision of the children of the public schools is organized under a school physician who devoted full time to this work, assisted by 9 nurses, 1 dentist, and 1 dental assistant. A complete physical examination is made each year of all children of the public schools. A total of 21,012 examinations was made in 1923, with 19,461 defects corrected. No physical examinations are required of children applying for working papers. There is no special activity for the promotion of mental health.

Industrial hygiene.—There is no industrial-hygiene work carried on by official agencies.

Public-health nursing.—Nine nurses were provided by the board of education, 3 by the welfare association, and 2 by the antituberculosis association, giving a ratio of 9.7 nurses per 100,000 population.

Laboratory.—A laboratory established in December, 1923, and located in the city-county hospital does all the work of the hospital, for special clinics, and for the health department, about one-third of the time being devoted to health-department work.

Food.—There are 360 dairies producing milk for the city which are inspected twice a year but not scored. Tuberculin testing of cows from which raw milk is sold is required. Seventy per cent of the milk supply was Pasteurized. The per capita daily consumption amounted to 0.7 pint, which is considerably below the desired standard of at least 1 pint per person per day. Inspections are made from time to time of food-handling establishments, and physical examination of food handlers is required by State law.

Sanitation.—Sanitary inspections are made as a result of citizens' complaints for the abatement of nuisances. Housing inspection is not included

among the activities of the health department. It is required by city ordinance that stable manure be removed weekly. There is no special organized work for the prevention of mosquito and rat breeding.

Public utilities.—The public water supply, owned by the city, is derived from Lake Worth and from deep wells and is treated by coagulation, sedimentation, rapid sand filtration, and chlorination. It was estimated that there were 25 deep drilled wells still in use. The separate sewerage system is employed and accommodated from 80 to 85 per cent of the population, and a new treatment plan is practically completed which employs Imhoff tanks, sprinkling filters, and chlorination before discharge of the effluent into the river. There were 4,100 surface privies still in use in the outskirts of the city. Scavengers are not licensed.

Public-health education.—The only official activity in health education and publicity is carried on by the health officer, who utilizes the press and delivers occasional lectures on health topics. The antituberculosis association distributes literature and carries on special work in this particular field.

Special comment.—There is needed, first of all, an increased appropriation for health work by the health department, with an increase in salary for the health officer adequate for full-time service. Need for additional medical and nursing personnel is also fairly indicated, in order that a definite program may be developed for the control of communicable diseases according to standards of the American Public Health Association, for the development of programs for the control of tuberculosis and venereal diseases, and for the protection of maternity and infancy and childhood. Provision should be made for complete physical examinations of children of the parochial schools at least three times during school life. An active campaign of public-health education should be instituted.

GRAND RAPIDS, MICH.

The population of Grand Rapids was 145,947, classified as 74.2 per cent native white, 25 per cent foreign born, and 0.8 per cent colored. There were 8,100 people per square mile. The taxable valuation was \$1,443 per capita.

Administration.—The commission-manager form of government is employed. There is no advisory council or board of health. The health officer serves under the department of public welfare and has broad administrative powers. His position is not under civil service, although he serves for an indefinite term, his salary being \$6,200.

Expenditures.—The total per capita health department expenditures in 1923 amounted to \$1.44 of which \$0.79 was for hospitals and \$0.04 for plumbing inspection. In 1920, \$0.62 was appropriated for the health department for health services to which \$0.38 per capita was added for hospital care of communicable diseases.

Vital statistics.—The collection and analysis of vital statistics are functions of the health officer and practices conform to modern standards.

Communicable-disease control.—Reporting of communicable diseases is considerably better than average and general control practices conform to standards of the American Public Health Association except for the release of convalescent typhoid patients without first securing negative stool and urine cultures. Hospitalization is well carried out.

Tuberculosis.—There were 236 cases with 123 deaths. The visits by nurses in behalf of tuberculosis cases numbered 6,744. Three day and one evening clinics are maintained, while 126 beds are available at the county sanatorium.

Veneral diseases.—Reporting is by name and address to the State health department, but records are not available in the local department. One clinic is maintained by the health department.

Child hygiene.—Of 3,444 live births, 124 were attended by midwives and 83 occurred in hospitals. There are 293 prenatal cases registered at clinic, while 7,699 infants and preschool children paid 10,999 clinic visits. Health supervision of children of public and parochial schools is carried on by the health department, there being one physician for each 9,000 pupils, and one nurse for each 2,000 pupils. A complete physical examination is given children of grades 1 and 5 yearly, and in 6,418 examinations by physicians 10,730 defects were discovered. During the year 2,086 defects were reported corrected. It is optional with the issuing officer, who is the health officer, whether or not a child applying for working papers shall be physically examined.

Mental hygiene.—The board of education has two full-time psychologists assisted by a health department physician with special training, who examine all cases referred by various agencies and persons. Special classes are provided as needed.

Industrial hygiene.—There is no official work done locally.

Public-health nursing.—There were 19 nurses provided by the health department and 30 by volunteer agencies.

Laboratory.—There were 583 examinations of water, 6 of typhoid specimens, 1,200 of tuberculosis smears, 1,000 of diphtheria cultures, and 100 of urine samples.

Food and sanitation.—Systematic supervision over milk and food supplies is exercised. Sanitary inspections and reinspections are regularly made. Cattle from which Grade A raw milk and certified milk are sold must be tuberculin tested. Ninety per cent of the supply was Pasteurized. The per capita milk consumption amounted to 0.7 pint or 30 per cent below the desired standard.

Public utilities.—The public water supply owned by the city is derived from the river and treated by coagulation, sedimentation, lime, filtration, and chlorination. The combined sewerage system was used by 90 per cent of the population, the sewage being discharged untreated into the river.

Public-health education.—The health officer publishes a monthly statistical bulletin of 250 copies, utilizes the daily press, delivers frequent lectures, and has prepared a health exhibit.

Special comment.—Additional physicians are needed for school work. The preschool hygiene program might be extended and increased milk drinking stimulated.

HARRISBURG, PA.

The population of Harrisburg was 81,129, classified as 87.7 per cent native white, 5.4 per cent foreign born, and 6.9 per cent colored. The city occupies a land area of 6.3 square miles giving a population per square mile of 12,878. The taxable valuation was \$832 per capita.

Administration.—The city is governed by five commissioners, one of whom is elected as mayor. There is a board of health of five members elected by the commission to serve for a term of five years, one member retiring each year. At least two members must be physicians. The functions of this board are to promulgate regulations, issue licenses, conduct hearings, and prepare the budget. The bureau of health and sanitation is a division of the department of public safety. The health officer is appointed by the commission on a part-time basis at a salary of \$2,800. The position is not under civil service. The health officer has been elected secretary of the board of health.

Expenditures.—The expenditures of the health department amounted to \$0.29 per capita, including \$0.05 for plumbing inspection.

Vital statistics.—Vital statistics are collected by representatives of the State department of health, there being a local registrar in Harrisburg who transmits copies of the reports to the health department. The probable percentage of births reported is 98, while 100 per cent of deaths are considered reported.

Communicable-disease control.—Reporting of communicable diseases is creditably complete. The periods of isolation are from 30 to 60 days in case of scarlet fever and 16 days in case of measles, and seem to be longer than experience indicates as necessary. Cases of typhoid are apparently released without first securing negative stool and urine cultures. Facilities for hospital isolation are inadequate, and none of the cases of diphtheria or scarlet fever were hospitalized during the year.

Tuberculosis.—The fact that 56 deaths were recorded with only 37 cases reported is apparent indication of incompleteness of reporting of this disease. There is one clinic provided under State auspices, a total of 274 patients (217 new patients) is on active records as having made 1,350 clinic visits. The number of visits by nurses in behalf of tuberculosis cases was 3,193. Forty beds are available. The only hospital provision for bed cases is in the county almshouse, to which 10 patients were admitted during the year.

Venereal disease.—Reporting according to State law is by name and address to the health department, there being 3 cases of syphilis and 1 case of gonorrhea reported. It is not required that cases be reported as long as they are maintained under treatment by physicians. Clinic facilities are provided at the Harrisburg Hospital, where 183 patients were registered during the year and 1,116 treatments were given.

Child hygiene.—There is no prenatal clinic service, but 80 nursing visits were made in behalf of prenatal cases during the year. Of the 1,514 live births, 585 occurred in hospitals, while only 5 were attended by midwives, who are examined and licensed by the State department of health. Four infant-welfare clinics are operated by the visiting nurse association. There were 769 children under 2 years of age who paid 2,308 visits to clinics, while 4,268 nursing visits were made to homes. Health supervision of children of the public schools was carried on by the board of education, while the health department supervises the work in the parochial schools. A physical examination is given the grade children of the public schools, but this examination is not sufficiently complete to include lungs. Thirty-nine per cent of the teeth defects were corrected during the year, while 30 per cent of the children having tonsil defects were operated on, and 14 per cent of the defects of vision and 33 per cent of defects of hearing received attention. Children desiring to enter industries must first secure a permit from the school attendance officer and must attend a continuation school.

Mental hygiene.—One diagnostic clinic is held regularly through cooperation with the board of education.

Industrial hygiene.—The only industrial hygiene is that carried on by individual concerns.

Public-health nursing.—One nurse was provided by the health department, 2 by the board of education, 11 by the visiting nurse association, and 4 by the State health department, giving a ratio of 22.2 nurses per 100,000 population.

Laboratory.—A well-equipped laboratory is maintained at the Harrisburg Hospital for the bacteriological and chemical examinations of water and milk and for a limited number of diagnostic examinations.

Food.—Two food inspectors are maintained on a part-time basis. Eighty-five per cent of the milk supply was Pasteurized. Inspections are regularly made of food-handling establishments.

Sanitation.—Inspections are made as a result of citizens' complaints for the abatement of nuisances. Plumbing inspection is handled by the health department. Special regulations exist for the control of fly breeding.

Public utilities.—The public water supply, owned by the city, is derived from the Susquehanna River, and is treated by rapid sand filtration and chlorination before being served to 98 per cent of the population. Laboratory examinations of the water showed *B. coli* to be absent in the treated samples. Both the combined and separate sewerage systems are employed, the sewage being discharged raw into the river. There were 200 privy vaults still in use in outlying districts.

Public-health education.—There is no organized public-health education work carried on by the health department.

Special comment.—There is need for increased health appropriations to make possible a program for the control of tuberculosis and venereal diseases and for the development of a comprehensive program of prenatal, infant, and preschool hygiene. Health supervision of school children should be extended to include a complete physical examination (including heart and lungs) at least three times during the school career of each child. Public-health education should be developed, and close supervision over the milk supply maintained.

HARTFORD, CONN.

The population of Hartford was 152,138, classified as 67.4 per cent native white, 29.5 per cent foreign born, and 3.1 per cent colored. An area of 17.4 square miles is occupied, giving a population of 8,744 per square mile. The total taxable valuation was \$1,777 per capita.

Administration.—A mayor and board of aldermen govern the city. A board of health commissioners of six members is appointed by the mayor for a term of two years for legislative and executive purposes. The superintendent of health is appointed by the board on a full-time basis for an indefinite term at a salary of \$4,500 (\$4,000 in 1920). The position is not under civil service, written charges with a majority vote of the board being necessary for removal of the executive officer, who has held the position 16 years. The powers of appointment and dismissal of subordinates, making rules and regulations, rest with the board of health, while salaries are fixed by the board of finance.

Expenditures.—The total expenditures of the health department in 1923 amounted to \$0.97 per capita, of which \$0.48 was for hospitals. In 1920, \$0.87 per capita were expended, \$0.43 being for health purposes proper and \$0.44 for hospital services.

Vital statistics.—The superintendent of health is registrar of vital statistics. Certificates of births and deaths are systematically checked and verified for completeness and accuracy, with the result that the probable percentage of births reported is 99 to 100 per cent and of deaths practically 100 per cent. Tabulations are made weekly, monthly, and annually, and tables are prepared with data classified according to color and nativity, age, sex, cause of death, occupation, and civil condition. Adjustments are made for residence. A report is published annually.

Communicable-disease control.—A creditable record is shown for the reporting and hospitalization of diphtheria and scarlet fever, 21 cases of diphtheria per death and 240 cases of scarlet fever per death being reported, with 40 per cent of the former and 30 per cent of the latter cared for in the isolation hospital, which has 75 beds for communicable-disease cases, exclusive of typhoid

cases, which are admitted to other hospitals in the city. It is stated that 99 per cent of the school children and over 90 per cent of the general population have been vaccinated against smallpox.

Tuberculosis.—There were 230 cases with 91 deaths reported. All work in the city directed by the Hartford Tuberculosis Society is in cooperation with the board of health. A clinic is held for one hour a week at the Hartford Dispensary, while nursing follow-up service is maintained by the visiting-nurse association, there having been 4,531 nursing visits paid to homes. There were 120 patients admitted to local hospitals, the Hartford Hospital maintaining a pavilion with 60 beds for early cases and the municipal hospital 6 beds for advanced cases.

Venereal disease.—Reporting is by office number to the health department. There were 121 cases of syphilis and 128 cases of gonorrhea reported in addition to the health department clinic cases, numbering 96 cases of syphilis, 186 of gonorrhea, and 42 others. Facilities are provided to the extent of 12 beds in local hospitals for bed cases of venereal disease. There is no social service or follow-up provided specifically for venereal-disease cases.

Child hygiene.—Services for the protection of mothers and preschool children are provided by the board of health which employs the visiting-nurse association to carry on the work. Prenatal and infant care are furnished at five prenatal clinics and at the Hartford Dispensary. Of 4,029 live births, 9.5 per cent were attended by midwives licensed and supervised by the State board of health. A total of 3,949 children under 2 years of age paid 9,787 visits to clinic, while 24,856 home visits were made by nurses. Health supervision of children of the public schools is maintained in varying degrees in the different school districts by physicians and nurses employed by the schools in each district. Certain districts also have dentists and dental hygienists. There is no coordinated plan for this work, and no general supervision is exercised. The scope of work varies, although efforts are made to give all grade school children a complete physical examination at irregular intervals and to secure correction of defects. No provision is made for children of the parochial schools. Children applying for working papers must pass a physical examination made by a physician appointed by the board of education before securing a certificate.

Mental hygiene.—A child guidance clinic is held every two weeks at one of the health stations, having been in operation since September, 1923.

Industrial hygiene.—All industrial diseases, according to State regulations, are required to be reported to the State department of health. The only industrial hygiene work done locally is by individual concerns.

Public-health nursing.—Thirteen nurses were provided by the school districts, and 24 by the visiting-nurse association, giving a ratio of 24.3 nurses per 100,000 population.

Laboratory.—A limited bacteriological and chemical service is provided under a part-time director. Of 9,810 examinations made, 4,962 were of milk (1,781 samples) and 3,877 of diphtheria. A total of 31 diagnostic examinations per 1,000 population is recorded.

Food.—Inspection of dairy farms is carried on by the State dairy and food commissioner. Tuberculin testing of all herds from which milk is sold raw is required. Seventy-five per cent of the supply was Pasteurized. The per capita daily consumption amounted to 1.03 pints. Licenses are issued to all food stores and restaurants and regular inspections of premises are made.

Sanitation.—Two inspectors are employed in making general sanitary inspections as a result of citizens' complaints, while tenements are inspected upon

the initiative of the department four times a year. Special measures are directed against fly and mosquito breeding.

Public utilities.—The public water supply, owned by the city, served over 99 per cent of the population with water treated by slow sand filtration and chlorination. The combined system of sewerage is employed, the sewage being discharged untreated into the Connecticut River. Approximately 99 per cent of the population was accommodated by this system, there being only 28 privy vaults and 34 cesspools in use in outlying districts.

Public-health education.—This work is carried out by the superintendent of health and consists of the publication of an annual report, the use of the daily press, and the delivery of lectures before various civic groups.

Special comment.—Since 1920 the health department has assumed increased responsibility for the protection of maternity and infancy and the provision of public-health nursing through special financial and administrative arrangements with the visiting-nurse association. A comprehensive program of school health supervision to include children of parochial schools should be developed. Public-health laboratory work should be extended. Increased appropriations for health purposes are needed to provide for additional nursing personnel and for increased attention to public-health education.

HOUSTON, TEX.

Houston is a city of 154,970 population, classified as 67.3 per cent native white, 8.7 per cent foreign born, and 24 per cent colored. An area of 48 square miles is occupied, giving a population per square mile of 3,229. The taxable valuation was \$1,273 per capita.

Administration.—The city is governed by a mayor and board of councilmen with a city manager. The board of health of seven members is appointed by the mayor to serve for terms of four years each. It is required that six of the members of the board be physicians. The health officer is appointed by the mayor on a full-time basis and serves for a period of two years at a salary of \$4,800. The requirements for office specify that he must be a qualified practitioner of medicine. Subordinates and employees of the health department serve under civil-service regulations. The power to make rules and regulations, issue orders, and the abatement of unsanitary conditions rest with the health officer.

Expenditures.—The per capita expenditure of the health department for health service in 1923 amounted to \$0.55, of which 78 per cent was set aside for salaries. This compares with \$0.33 spent for health services proper in 1920.

Vital statistics.—Registration of vital statistics is conducted by a special registrar of the health department. The International List of Causes of Death is used and certificates of births and deaths are checked. It is stated that 95 per cent of the births and over 99 per cent of the deaths are reported.

Communicable-disease control.—The reporting of cases of diphtheria and scarlet fever seems to be fairly complete, but only 3 cases of typhoid fever per death, 22 cases of measles per death, and 2.5 cases of whooping cough per death are reported. General measures for communicable-disease control correspond to accepted standards, except for gaseous fumigation after cases of diphtheria, scarlet fever, smallpox, cerebrospinal meningitis, acute poliomyelitis, tuberculosis, and anthrax. Eighty-seven per cent of the cases of typhoid, 50 per cent of the cases of diphtheria, 25 per cent of the cases of scarlet fever, 100 per cent of the cases of smallpox, and 10 per cent of the cases of measles

are hospitalized. Release from isolation of typhoid cases is based upon the finding of two negative stool cultures. Vaccination of school children is required.

Tuberculosis.—There were 175 cases of tuberculosis reported with 174 deaths, indicating the definite incompleteness of the notification of this disease. Clinic service for diagnosis is maintained by the city and the antituberculosis league, 253 new patients visiting the clinic during the year. A total of 14,279 nursing visits was made in behalf of tuberculosis cases, and 219 patients were admitted to hospitals located in the city during the year.

Venereal diseases.—Reporting of venereal diseases is by name and address or by office number to the health department, 350 cases of syphilis and 200 cases of gonorrhea having been reported during the year. A clinic is maintained at the city hospital, where 1,515 cases of syphilis and 1,315 cases of gonorrhea, in addition to 282 others, were treated. Hospital facilities are utilized at the municipal hospital.

Child hygiene.—Prenatal and infant welfare service is provided by nurses of the social-service bureau, who made 301 visits in behalf of prenatal cases during the year. A total of 387 children under 2 years of age made 896 visits to clinics. School health supervision of the children in public schools is provided by the board of education. Children of all grade schools and of the two junior high schools are given a physical examination on admission, but this is not sufficiently complete to include the heart and lungs. A total of 24,430 examinations was made during the year with 22,689 defects discovered, 1,490 having been corrected. General hygiene work in the parochial schools has been carried on by the health-department staff. Examinations of children applying for working papers is made only in special cases.

Public-health nursing.—Public-health nursing is organized under the social-service bureau, there being no nurses provided by the health department. Four nurses were supplied by the board of education, four by the antituberculosis league, and eight by the social-service bureau, giving a total of 10.3 per 100,000 population.

Laboratory.—The usual free diagnostic service is provided in addition to regular milk and water examinations, 83 diagnostic examinations per 1,000 population having been made in 1923.

Food.—The dairy farms are inspected and scored regularly, 1,236 inspections having been made. Tuberculin testing of herds from which raw milk is to be sold is required. Fifty per cent of the milk supply was Pasteurized.²⁰ The per capita consumption daily amounted to 0.9 pint. Food-handling establishments are regularly inspected, and physical examination of food handlers is required by State law every six months.

Sanitation.—The public water supply, owned by the city, served 90 per cent of the population with water from drilled wells. The sewerage system is chiefly of the separate type and accommodated 95 per cent of the population. The sewage is treated by the activated-sludge method, the effluent being discharged into the Bayou River. There were 10,200 privies still in use under the supervision of the health department, which requires that they be fly-proof. General sanitary inspections are made for the abatement of nuisances, and regular house-to-house inspections are made in routine twice a year. Special activities are directed against mosquito and fly breeding.

Public-health education.—The activity is carried on by the health officer, who prepares an annual report, utilizes the daily press, delivers lectures at schools, industrial plants, and the four nursing groups.

²⁰ In 1925, 75 per cent was Pasteurized.

Special comment.—Progress has been made during the past three years in securing hospitalization of communicable diseases, but reporting of typhoid, measles, whooping cough, and tuberculosis is still quite incomplete.²¹ Gaseous fumigation as a means of controlling communicable diseases should be discontinued. The provisions for maternity, infancy, and school health supervision should be considerably extended.²¹ Provision should be made for complete examination, including heart and lungs, of children of the public and parochial schools at least three times during school life. The Pasteurization of milk should be required by ordinance. Public-health education should be developed.

INDIANAPOLIS, IND.

Indianapolis is an industrial city of 342,718 people, of whom 83.6 per cent are native white, 5.4 per cent foreign born, and 11 per cent colored. An area of 48.6 square miles is occupied, giving a population per square mile of 7,023. The taxable valuation was \$1,805 per capita.

Administration.—The city is governed by a mayor and council. There is a board of health and charities. The full-time health officer and city sanitarian is appointed by the board for an indefinite term at a salary of \$5,500. This office is not under civil service, qualifications prescribed by law indicating that the incumbent must be a physician with special training in public-health work. Powers of fixing salaries and of making rules and regulations are delegated to the board of health.

Expenditures.—Of the \$1.56 per capita spent by the health department in 1924, \$1.09 was for hospitals, \$0.04 for poor relief, \$0.01 for plumbing inspection, and \$0.42 for health services proper. This compares with \$0.45 spent for health services in 1920.

Vital statistics.—Registration of vital statistics is conducted by the health department and verification of certificates indicates completeness of reporting of births and deaths. Reports are not published.

Communicable-disease control.—Reporting of diphtheria, scarlet fever, and whooping cough is more satisfactory than is the reporting of typhoid fever and measles. Only 4.2 cases per death are reported for typhoid and only 26 cases per death for measles. Cases of typhoid are released from isolation without evidence as to bacteriological findings, and gaseous fumigation is still practiced after diphtheria, scarlet fever, smallpox, cerebrospinal meningitis, acute anterior poliomyelitis, and tuberculosis. Twenty per cent of the cases of typhoid, 5 per cent of the cases of diphtheria, 10 per cent of the cases of scarlet fever, and 20 per cent of the cases of smallpox are hospitalized. Only a small percentage of the school children has been vaccinated.

Tuberculosis.—There were 343 cases reported with 367 deaths, an indication of incompleteness in the reporting of this disease. Clinic facilities are provided by the health department and 5,548 clinic patients are on the active records as having been seen within a period of 12 months, the number of clinic visits amounting to 12,803. A total of 145 beds for tuberculosis patients is available in city and county institutions, but records as to the number of patients admitted during the year are not complete.

Venereal diseases.—According to State law, venereal diseases are reported by name and address to the local health department, but the number of cases reported during the year is not available. One clinic is maintained at the city hospital by the health department.

²¹ Marked improvement in reporting has been observed since 1923, while the maternity and infant hygiene program has been extended.

Child hygiene.—There is a division of child hygiene in the health department under a full-time director who is not a physician. Prenatal clinics are held in connection with other clinic activities of the city dispensary. There is no effort to supervise midwives, other than the requirement that they be registered with the State. Seven infant-welfare clinics are conducted and 1,530 babies were registered as having made 8,546 visits during the year, a total of 19,642 nursing visits was made to homes in behalf of these infants. There is no organized effort to care for the preschool child, except through the infant-welfare stations. Health supervision of children, of both parochial and public schools is carried on by the division of school nursing in the health department and by six medical inspectors, employed on a full-time basis. Each school also has one teaching nurse employed by the board of education. An inspection is made by the nurses of all children upon entering and once a year thereafter, reexaminations being made by the medical inspectors. Classified records of defects found and cared for in 1923 are not available. Nutrition classes are held in selected schools, as are special classes for educationally exceptional children, and three fresh-air schools are conducted for pretuberculous children. Apparently no physical examination is required for children applying for working papers.

Mental hygiene.—Special cases selected as a result of the regular school examinations are taken to the mental and nervous clinic at the city dispensary for a more thorough examination. The city health department has established a psychopathic ward at the city hospital.

Industrial hygiene.—There is no special activity in industrial hygiene in the city except for the maintenance of nursing staffs by a few of the larger industrial concerns.

Public-health nursing.—Public-health nursing was performed by 50 nurses of the health department and 25 nurses of the local public-health nurse association, giving a ratio of 21.8 nurses per 100,000 population.

Laboratory.—A public-health laboratory is maintained which offers the usual bacteriological and chemical services to the community. There were 18 diagnostic examinations per 1,000 population in 1923.

Food.—The 1,500 dairy farms producing milk for the city are inspected and scored at least twice a year, 6,060 such inspections having been made during 1923. Tuberculin testing of herds from which raw milk is to be sold is required. It was stated that 98 per cent of the milk supply was Pasteurized. The per capita daily consumption averaged 0.3 pint. Inspections are regularly made and food-handling establishments, restaurants, bakeries, groceries, and candy stores are scored. According to State regulations, physical examinations of food handlers is required, approximately 15,000 examinations having been made during the year by practicing physicians.

Sanitation.—Sanitary inspections are made both for the abatement of nuisances as a result of citizens' complaints and upon the initiative of the department staff. Plumbing inspection is still considered a function of the health department. Special measures directed against flies include provision for fly-proof containers for stable manure with frequent removal.

Public utilities.—The public water supply derived from the White River is treated by coagulation, slow sand filtration, and chlorination, and served 70 per cent of the population. It is stated that 2.6 per cent of the 10-cubic-centimeter samples of the water analyzed showed *B. coli*. No records are available as to the private wells in use. Both the combined and separate systems of sewerage are employed. It was estimated that 70 per cent of the population was served. A sewage-treatment plant employing screens and an activated

sludge process is under construction. About 10,000 privy vaults were still in use, under the supervision of the health department.

Public-health education.—This work is carried on by the health officer, who utilizes the daily press and gives frequent lectures to women's clubs and civic organizations.

Special comment.—The need for increased appropriations for the health department is indicated. Measures for the control of communicable diseases should conform to standards accepted by the American Public Health Association. Increased provision should be made for the hospitalization of communicable diseases and for tuberculosis cases. Reporting of these cases should be stimulated. An active campaign of public-health education should be instituted.

JACKSONVILLE, FLA.

Jacksonville was credited with 100,046 people, 45.3 per cent of whom are colored. The city occupies an area of 16 square miles, giving a population per square mile of 6,253. The taxable valuation was \$751 per capita.

Administration.—The city is governed by a commission which performs the usual functions of a board of health. The health officer is appointed by the city commission to serve for an indefinite term on a full-time basis at a salary of \$4,800. His period of service may be terminated at the pleasure of the commission. The appointment and dismissal of subordinates, the fixing of salaries, the making of rules and regulations, and the hearing of appeals from orders rest with the city commission.

Expenditures.—The total expenditures of the health department in 1923 amounted to \$1.10 per capita, of which \$0.12 was for the city dispensary, \$0.11 for antimosquito work, and \$0.04 for miscellaneous activities, leaving \$0.83 for health purposes proper. In 1920 the total expenditure of the health department amounted to \$0.83, \$0.75 of which was for health purposes.

Vital statistics.—The collection of vital statistics is conducted by the health department. Certificates of births and deaths are checked. From 90 to 95 per cent of the births are reported and 100 per cent of the deaths. It is stated that the sanitary inspectors and the nurses make a house-to-house canvass once a year as a check on births and deaths.

Communicable-disease control.—Practically all control measures are carried out under the division of public-health nursing with the assistance of sanitary inspectors. Reporting of the principal communicable diseases is apparently incomplete for typhoid, diphtheria, and scarlet fever, as shown by the fact that there were only 3 cases of typhoid for each annual death, less than 5 cases of diphtheria for each annual death, and only 10 cases of scarlet fever for each annual death. Gaseous fumigation is still practiced after cases of smallpox and tuberculosis. There are 32 beds available for cases of communicable disease per 100,000 population. Seventy per cent of the school children have been vaccinated.

Tuberculosis.—There were 251 cases with 184 deaths reported from this disease, an indication of incompleteness. Clinic facilities are provided at the health-department dispensary, where 368 patients were under observation during the year. Sixteen beds are available for city cases at the county hospital, but the record of cases admitted during the year was not available.

Venereal diseases.—Reporting according to State law is by office number to the health department, there being 1,573 cases of syphilis, 962 cases of gonorrhea, and 140 other cases reported. A venereal-disease clinic is main-

tained in connection with the dispensary service, where 3,731 cases of syphilis, 665 cases of gonorrhea, and 108 other cases were treated.

Child hygiene.—This work is organized under the public-health nursing division. Of 2,215 live births, 36.5 per cent were attended by midwives, who are under the supervision of the health department. There were 1,112 babies registered at the infant-welfare clinic maintained at the city dispensary, while 7,815 nursing visits were made to homes. Health supervision of children of the public schools is maintained by the health department. A physical examination which does not include heart and lungs is given all children upon admission and first, third, and fifth grades each year thereafter. A physical examination of children applying for working papers is given by the county physician whenever such examination is deemed necessary. There is no work carried on by the health department for the promotion of mental health.

Industrial hygiene.—There is no organized industrial hygiene work in Jacksonville.

Public-health nursing.—There is a separate bureau of public-health nursing in the health department with a total of 11 nurses working on the generalized plan, which gives a ratio of 11 nurses per 100,000 population.

Laboratory.—A laboratory is maintained for the examination of milk and water and occasionally of food. All diagnostic work is done in the State laboratory located in the city.

Food.—Dairies producing milk for the city are inspected from time to time but not scored. Tuberculin testing of all herds producing milk for the city is carried out by the State livestock board once a year. Pasteurization is not required, but 50 per cent of the supply was said to be Pasteurized. The per capita milk consumption amounted to 0.5 pint daily, which is half the desired standard. Inspections are regularly made of meats slaughtered on farms and of stores and eating places.

Sanitation.—General house-to-house inspections are made in routine every two months as well as follow-up inspections as the result of complaints for the abatement of nuisances. Prompt removal of stable manure is required to prevent fly breeding, and special measures are directed against breeding of mosquitos and rats.

Public utilities.—The public water supply, owned by the city and derived from artesian wells, is aerated to remove sulphur fumes and then chlorinated before serving 90 per cent of the population. The separate system of sewerage is employed, the sewage being discharged untreated into St. Johns River. This service was accessible to 65 per cent of the population. It was estimated that there were 6,848 surface privies still in use, largely in the poorer section of the town. There is a special health department ordinance which requires that privies shall be of required type.

Public-health education.—The health officer utilizes the daily press and exhibits on mosquito-control work. He also delivers lectures on general health subjects from time to time. Otherwise there is no public-health education work of an official character.

Special comment.—There is need for an increased health appropriation in order that measures for the control of the principal communicable diseases may be extended in accordance with the standards of the American Public Health Association. The program for tuberculosis and venereal disease control should be extended and activities for the care of maternity and infancy developed. There should also be undertaken additional measures for health supervision of preschool children and of children of the parochial schools. Nursing activities should be extended.

JERSEY CITY, N. J.

Jersey City had a population of 309,034, classified as 77.5 per cent native white, 22 per cent foreign born, and 0.5 per cent colored. Nineteen square miles are occupied, giving a population per square mile of 16,265. The taxable valuation amounted to \$1,544 per capita.

Administration.—The form of government consists of a mayor and four commissioners. The usual duties of a board of health are assumed by the mayor and board of commissioners. A medical director is appointed under civil service for an indefinite term at a salary of \$7,500, and he directs all official medical activities in the city in addition to serving as superintendent of the city hospital. The power is given the medical director through the city commissioners to appoint and dismiss subordinates. For administrative purposes, four separate divisions are organized—sanitary, medical (control of communicable diseases and inspection of parochial schools), child hygiene, and city hospital.

Expenditures.—The per capita expenditure in 1923 was \$2.98, of which \$2.02 was spent for hospitals and \$0.06 for plumbing inspection. In 1920, \$0.66 per capita was expended for health purposes.

Vital statistics.—Registration is conducted by the county board of health and conforms with modern standards.

Communicable-disease control.—Reporting of communicable disease is apparently incomplete, as the number of cases per death for typhoid, scarlet fever, measles, and whooping cough average less than half the standards set by the American Public Health Association. No period of isolation is specified for typhoid, and no effort has been made to secure stool or urine cultures before release of the patient. There are 50 beds per 100,000 population for communicable-disease cases, and 20 per cent of the typhoid cases and 100 per cent of the smallpox cases are hospitalized, but only 10 per cent each of diphtheria and scarlet-fever cases are thus cared for in the modern municipal hospital and the Hudson County contagious hospital.

Tuberculosis.—A record of 244 cases of tuberculosis in 1922, with 297 deaths, and 305 deaths in 1923, with case reports not available, suggests incompleteness of notification of this disease to health department officials. A total of 334 beds is available for adults and 25 for children in three different city, county, and State institutions, while 511 patients were admitted during the year, 90 per cent of whom were classified as advanced cases. Most of the anti-tuberculosis activities are carried on by the Hudson County tuberculosis hospital and sanatorium. A clinic is conducted in the Jersey City hospital, which also sets aside 4 wards for tuberculosis patients.

Venereal diseases.—Notification is by name and address to the city and State health departments. Cases of venereal disease are treated free at the city hospital where a clinic is held three days a week. A total of 800 cases of syphilis and 1,200 cases of gonorrhea was thus treated in 1923. Twenty-five beds are available for these cases and 164 patients were cared for. Five social-service workers made 242 visits in behalf of these cases.

Child hygiene.—Of 9,159 births recorded, 670 occurred in hospital, while 20 per cent of the births were reported by midwives, who are supervised by the State and also by the director of child hygiene of the city. Special classes held for midwives are attended by 90 per cent of those registered. There were 393 expectant mothers who attended the prenatal clinic at the hospital. Infant-welfare clinics are maintained in 12 wards of the city where 4,438 children were cared for during the year. The central station provides hospital facilities for a limited number of sick infants during emergency periods. Nursing visits

in behalf of infants numbered 16,778. Health supervision of 17,000 children of the parochial schools is exercised by the health department. A director of medical inspection with a corps of nurses and dentists is maintained by the board of education in behalf of children in public schools. A complete physical examination is given all children once a year and a continuous record of each child is kept. A total of 41,942 physical examinations of public-school children was made, and 18,749 defects found, 26 per cent of which were corrected. A physical examination by a school physician is required of children applying for working papers, 2,004 examinations having been made.

Mental hygiene.—No official work is done in mental hygiene, except incidentally in connection with the schools.

Industrial hygiene.—All work of this character is done by State officials.

Public-health nursing.—There is no central supervision of nurses. Twenty-four nurses were supplied by the health department, 22 by the board of education, and 13 by the tuberculosis organization, giving a ratio of 19.1 nurses per 100,000 population.

Laboratory.—The usual free bacteriological service is provided at the city and county laboratories maintained at the Jersey City hospital.

Food.—Dairy farms in the vicinity and milk plants are inspected and farms are scored annually. It was stated that 90 per cent of the milk supply was Pasteurized, less than 1 per cent being certified. The daily per capita consumption amounted to 1 pint. Inspection of all food establishments is a part of the work of the division of sanitation. Licenses are issued to abattoir and chicken houses.

Sanitation.—The scope of sanitary inspections covers general nuisances and health hazards. House-to-house inspections are routinely made. Plumbing inspection is also carried on by the health department. Special provisions are made for the prevention of fly breeding. No organized effort is made against rat breeding, but the county carries on a campaign to avoid mosquito breeding.

Public utilities.—The public water supply, owned by the city, served all the people with water from the Rockaway River, treated by coagulation and chlorination. The combined system of sewerage is employed, and was utilized by 99 per cent of the population. Untreated sewage is discharged into rivers and bays near by. There were 80 privy vaults still in use, with legal provision for their sanitary maintenance.

Public-health education.—An annual report of 1,000 copies is published. Twenty lectures were given by the medical director and sanitary officer to nurses, physicians, and the laity. Lantern slides on health topics are shown in theaters.

Special comment.—More complete reporting of communicable diseases should be stimulated. Although the county plan of tuberculosis control seems well organized in certain particulars, it is evident that means should be exercised to stimulate early reporting of cases. Bacteriological examinations of milk are not sufficiently extensive and frequent to provide adequate supervision of this important food product.

KANSAS CITY, KANS.

Kansas City was credited with 115,781 people, classified as 82 per cent native white, 10 per cent foreign born, and 8 per cent colored. An area of 21 square miles is occupied, giving a population per square mile of 5,513. The taxable valuation was \$1,048 per capita.

Administration.—The city is governed by a commission. The health department is organized under the commissioner of parks and public property,

with a commissioner of health and sanitation as executive officer. There is no board of health or advisory council. The commissioner of health and sanitation is appointed under civil-service regulations for an indefinite term on a full-time basis at a salary of \$3,000. The personnel of the department is also appointed under civil-service regulations, the salaries being determined by the board of commissioners. The health commissioner issues the rules and regulations of the department and has necessary powers in epidemics.

Expenditures.—The total expenditure of the health department in 1923 amounted to \$0.30 per capita, all of this having been for health purposes. In 1920, \$0.23 per capita was spent for health purposes, while \$0.02 was devoted to hospital services.²²

Vital statistics.—The registration of vital statistics is conducted by the city clerk, who sends a weekly report of deaths to the health department. The birth and death certificates are checked for completeness and the health department prepares classified tabulations.

Communicable-disease control.—Reporting of communicable diseases to the health department is considerably more complete than in the average city. An infectious-disease hospital of 65 beds has recently been acquired. Approximately 75 per cent of the school children have been vaccinated against small-pox.

Tuberculosis.—There were 257 cases, with 121 deaths reported. Clinics are provided at the Kansas University Medical School, where 40 patients were registered, and at the dispensary, where 85 patients were under care, in addition to a chest clinic at Bethany Hospital. Bedside care and follow-up work are provided by one nurse of the visiting nurse association. The city maintained a fresh-air camp for three weeks in 1925 for pretuberculous children.

Venereal diseases.—There were 150 cases of syphilis, 220 cases of gonorrhea, and 1,450 other cases reported by office number to the local health department. Three clinics are maintained, one of them by the health department, with a total of 1,209 cases under care.

Child hygiene.—Of 3,026 live births, less than 1 per cent are delivered by midwives. One prenatal clinic and one infant-welfare clinic are maintained by one of the local hospitals, while 1,198 infants were visited in their homes by nurses of the visiting nurse association. Children of the public schools are inspected at least annually by nurses of the board of education. There are no activities in the field of mental hygiene. A part-time dentist is also employed. A temporary working permit is granted to children between 14 and 16 years of age, if they desire such permits and have completed the eighth grade. A certificate is granted those of 16 years of age without requiring physical examination.

Industrial hygiene.—There is no official activity in industrial hygiene locally.

Public-health nursing.—The health department maintained 1 nurse for communicable-disease work, the board of education had 5, the visiting nurse association 13, and the Red Cross 1, giving a ratio of 17.2 nurses per 100,000 population.

Laboratory.—A limited public health laboratory service is provided, 9 diagnostic examinations per 1,000 population having been made.

Food.—There are 633 dairy farms producing milk for the city, which are inspected and scored from time to time by the health department, 399 inspections having been made. All the cows are tuberculin tested, but only 62 per

²² The 1925 budget provides for an expenditure of 49 cents per capita, 16 cents of which are for communicable disease hospital maintenance.

cent of the supply was Pasteurized. Food establishments are inspected and physical examination of food handlers is required, 4,000 such examinations having been made.

Sanitation.—Sanitary inspections are made as a result of complaints for the abatement of nuisances and as routine house-to-house inspections. Inspection of lodging houses is a State function. The collection and disposal of garbage and refuse is handled by the health department, disposal being by feeding to hogs.

Public utilities.—The public water supply owned by the city is derived from the Missouri River and is treated by sedimentation, filtration, and chlorination. Eighty per cent of the population was served. Laboratory analyses of the treated water showed *B. coli* present in 0.05 per cent of the 10 cubic centimeter samples. The public sewerage system accommodated about 85 per cent of the population, the sewage being discharged untreated into the Kansas and Missouri Rivers.

Public health education.—The first published report was issued in 1924. Press notices are regularly prepared by the health commissioner, who also delivers 50 lectures a year on health topics.

Special comment.—Progress has been made since 1920 in securing hospital facilities for care of communicable diseases and in extending laboratory facilities. There is need for increased appropriations for health work to provide for additional personnel and for the development of a more extensive health program. This should include antituberculosis work and increased activities in venereal-disease control, the care of expectant mothers, infants, and pre-school and school children, as well as the development of public-health education.

KANSAS CITY, MO.

The population of Kansas City was 351,819, classified as 76.2 per cent native white, 13 per cent foreign born, and 10.8 per cent colored. The population per square mile is 5,859 persons. The total taxable valuation was stated at \$1,281 per capita.

Administration.—The city is governed by a mayor and council. There is a board of health of three members appointed by the mayor for terms of three years each, their function being the administration of the health department and hospitals of the city. The commissioner of health is appointed by the mayor on a full-time basis for an indefinite term at a salary of \$4,800. It is required that he must have practiced medicine in the city for three years. The appointment and dismissal of subordinates, the making of rules and regulations, and the issuing of orders, rest with the health and hospital board, which acts upon recommendations of the commissioner.

Expenditures.—The total expenditures by the health department in 1923 amounted to \$3.07 per capita, \$0.51 having been for health purposes proper, \$2.13 for hospitals, \$0.39 for garbage collection and disposal, and \$0.04 for medical relief of the sick poor. In 1920, the per capita expenditures of the health department amounted to \$1.80, of which \$1.18 was for hospitals, \$0.13 for garbage, and \$0.22 for miscellaneous purposes. The health department expenditures for health purposes proper are still lower than the average for cities of this class.

Vital statistics.—The health commissioner is by virtue of his office registrar of vital statistics. Certificates are checked for completeness and accuracy, and it is reported that about 80 per cent of the births and 100 per cent of the deaths are reported. There are no published reports issued by the registrar.

Communicable-disease control.—The fact that an average of only 2.6 cases of typhoid fever and 13.5 cases of diphtheria for each annual death are reported is indication of incompleteness of reporting of these diseases, but reports of cases of scarlet fever and measles are more satisfactory in this regard. Cases of measles are isolated for a period of 14 days and those of whooping cough for 42 days, while gaseous fumigation is practiced after cases of diphtheria, scarlet fever, smallpox, measles, cerebrospinal meningitis, acute anterior poliomyelitis, and tuberculosis. Approximately 90 per cent of the cases of smallpox are hospitalized.

Tuberculosis.—In 1922, 404 cases of tuberculosis with 336 deaths were reported, while 356 deaths from this disease were recorded in 1923. During this year 2,400 cases of tuberculosis were visited by nurses, a total of 12,601 visits having been paid. A tuberculosis clinic is operated at the city hospital. Two diagnostic clinics (3,824 patients) are maintained by the Kansas City Tuberculosis Society. There are 387 beds available for tuberculosis cases in the city and State institutions, 560 patients having been admitted during the year.

Venereal diseases.—Reporting is by office number to the local health department, and also to the State. There were 662 cases of syphilis, 322 cases of gonorrhea, and 43 other cases reported, while a total of 3,093 cases were treated at the city hospital during the year. There are 15 beds available for venereal-disease cases at the general hospital and at the city hospital. The social hygiene service of the health conservation association maintains one whole-time and one part-time social worker for the follow-up of cases from clinics and sex delinquents.

Child hygiene.—A total of 561 visits of expectant mothers was made to the city hospital dispensary during the year. There are 13 prenatal clinics operated by voluntary agencies in the city which registered 1,588 clinic patients, while 1,320 home visits were made to patients of 6 of these clinics. Midwives are licensed by the State, but data are not available as to the proportion of births attended by midwives. Nine infant-welfare clinics are operated by voluntary agencies and 4,888 babies were registered as having made 9,584 clinic visits during the year, while 45,295 home visits were made by nurses. Health supervision of children of the public schools is carried on by the department of health and physical educators of the board of education. Physical inspections are made by nurses, while orthopedic examinations are made by a physical-education director. The complete staff includes 2 physicians, 3 supervising nurses, 47 staff nurses, and 90 physical-education teachers. During the year 8,300 examinations were made and 35,801 defects discovered, while 18,269 defects were corrected. It is required that children applying for working papers first pass a physical examination given by the school or a private physician.

Mental hygiene.—The school psychologist refers special cases to the psychiatric clinic conducted at the general hospital by the city, and at the dispensary by the mental hygiene committee of the health conservation society. Special classes are conducted by the school board of educationally exceptional children.

Industrial hygiene.—Several industries maintain plant physicians and industrial nurses, but there are no organized activities by official agencies.

Public-health nursing.—Fifty nurses were employed by the board of education and 48 nurses by the visiting nurse association, giving a ratio of 27.8 nurses per 100,000 population working on a specialized plan.

Laboratory.—A laboratory for disease diagnosis is conducted by the general hospital, where 17,257 diagnostic examinations were made. All examinations of

milk, food, and drugs are made in a drug and food laboratory conducted in a different part of the city. The city also employs a chemist with a separate laboratory in the city hall, where samples of water from wells and private supplies, as well as examinations for various municipal departments, are carried on.

Food.—A total of 1,300 inspections was made of dairy farms and milk plants during the year. Tuberculin tests are required made of all herds twice a year. Sixty per cent of the milk supply was Pasteurized. The per capita milk consumption amounted to 0.6 pint daily, which is 0.4 pint less than the desired minimum standard. Inspections are made of sanitary conditions of food stores and of the purity of foods, drugs, and chemicals. Approximately 8,900 of such inspections were made during the year. There are no slaughterhouses in the city, but there are several large packing houses under the supervision of Federal inspectors.

Sanitation.—The city is divided into 22 districts, each in charge of an inspector, who supervises quarantine and makes sanitary inspections, chiefly for the abatement of nuisances as a result of citizens' complaints. The disposal of garbage and refuse is still a function of the health and hospital board, the method of disposal being by feeding to hogs.

Public utilities.—The public water supply owned by the city is derived from the Missouri River and is treated by sedimentation, coagulation, and chlorination. Laboratory analyses of 10 cubic centimeter samples of treated water showed *B. coli* present in 7 per cent of the cases. Both the combined and separate systems of sewerage are employed and were accessible for 85 per cent of the population. Except for settling chambers and contact beds, which accommodated a population of 6,000 people, sewage is untreated and is discharged into the Missouri River and its tributaries. There were 2,500 privy vaults in use in outlying districts of the city.

Public-health education.—The health commissioner utilizes the daily press for general articles on health once a week and delivers lectures on health topics. Voluntary agencies are active in health educational work.

Special comment.—The appropriation for health purposes proper should be materially increased, while responsibility for garbage disposal might well be transferred to an engineering department. A comprehensive program for the protection of maternity and infancy should be developed, and a public-health nursing staff should be added to the official health department organization. Stimulus should be given to increased Pasteurization of milk. Measures for the control of communicable disease should be made to conform more closely to standards of the American Public Health Association.

KNOXVILLE, TENN.

Knoxville is a city of 88,217 population, of which 13 per cent are colored. The city occupies an area of 26.4 square miles, giving a population per square mile of 3,341. The taxable valuation was \$1,097 per capita.

Administration.—The city is governed by a city manager and council. There is no advisory council nor board of health, the health department operating under the director of the department of public welfare. In 1923 the director of health was a part-time appointee, having been appointed by the city manager at a salary of \$1,800. The position is under civil service. The appointment and dismissal of subordinates rests with the city manager and the director of public welfare, as does the fixing of salaries, while the making of rules and regulations is a duty of the city council on the recommendation of the city

manager. In 1924, under the new city manager plan of government, a full-time health officer was appointed at a salary of \$4,500.

Expenditures.—The expenditures of the health department amounted in 1923 to \$0.21 per capita. The 1924 budget amounted to \$0.34 per capita, of which \$0.06 was for smallpox hospital. The appropriation for the year 1924-25 was \$0.71 per capita.

Vital statistics.—The collection of vital statistics is conducted by a registrar of vital statistics appointed by the State, and reports of births and deaths are received by the health department, while checks are made of completeness and accuracy of records. It is stated that 80 per cent of the births are reported, and over 99 per cent of the deaths. Data concerning births, deaths, and communicable disease fatalities are tabulated and submitted in monthly reports to the bureau of health.

Communicable disease control.—For the year 1923-24 an average of 9.2 cases per death of typhoid, 23.3 cases per death of diphtheria, 33.5 cases per death of measles, 49 cases per death of scarlet fever, and 4.5 cases per death of whooping cough were reported. Gaseous fumigation is still practiced after cases of diphtheria, scarlet fever, smallpox, cerebrospinal meningitis, acute anterior poliomyelitis, and tuberculosis. Cases of typhoid fever are released from isolation without first securing negative cultures from stools and urine. It is reported that approximately 100 per cent of the school children have been vaccinated. There are 85 hospital beds available for smallpox cases, but there are no facilities for hospitalization of diphtheria and scarlet fever cases.

Tuberculosis.—There were 123 deaths recorded in 1923-24, but relatively few cases of tuberculosis were reported to the health department. Clinic facilities are provided at the health center and at the general hospital. Sixty-four hospital beds are available in the city and county hospitals. Nursing service is provided by voluntary agencies.

Venereal diseases.—Reporting, according to State and municipal law, is by office number to the State department of health, there having been 492 cases of syphilis, 491 cases of gonorrhea, and 48 other cases reported. A health department clinic is maintained, as well as a clinic at the general hospital. In all, 437 cases of syphilis, 467 cases of gonorrhea, and 47 other cases were treated. Follow-up service is provided by two nurses, who made 300 visits to homes during the year, in addition to the social-service visits made by special workers from the health center.

Child hygiene.—Prenatal and infant welfare work is carried on largely by voluntary agencies. Of 1,900 live births only 1 per cent were attended by midwives, there being 6 midwives registered in the city. A total of 773 nurses' visits was made to homes in behalf of prenatal cases, while 46 visits were made by prenatal cases to clinics. Two infant welfare clinics were maintained by voluntary agencies, and 1,500 children under two years of age paid 3,449 visits to clinics during the year, while 2,381 nurses' visits were made to homes of children of this age group. Health supervision of children of the public schools is carried on by the medical and nursing staff employed by the board of education. A complete physical examination is given the children of the grammar and high schools once a year, but no summary of the results of these examinations is maintained. It is not required that children applying for working papers pass a physical examination before receiving a certificate. There is no organized activity for the promotion of mental health.

Industrial hygiene.—The only industrial hygiene work in Knoxville is that carried on by individual concerns with the cooperation of the health department.

Public-health nursing.—Two nurses were employed by the health department for work at the venereal disease clinic, with an additional nurse at the small-pox hospital. Five nurses are provided by the board of education, 11 by the Red Cross, 2 by the child's free clinic, and 1 by the antituberculosis association, giving a ratio of 23.8 nurses per 100,000 population. On April 1, 1925, the school nursing service, the Red Cross nursing service, and the Metropolitan Life Insurance Co. nursing service were consolidated under a director of public-health nursing from the bureau of health, and 2 extra nurses were added.

Laboratory.—The public-health laboratory is maintained for the examination of water, milk, ice cream, and bacteriological specimens. A total of 37 diagnostic examinations per 1,000 population were made during the year. A special study has been made of typhoid carriers among milk handlers.

Foods.—There were 286 inspections made of the 200 dairies producing milk for the city during the year. The requirement that all herds be tuberculin-tested is only partially enforced. Inspections are made from time to time of the three milk plants in which approximately 10 per cent of the milk supply was Pasteurized. All food-handling establishments are regularly inspected.

Sanitation.—Inspections were made chiefly as a result of citizens' complaints for the abatement of nuisances. There are no special activities directed against fly and mosquito breeding. In 1925 the city was divided into five districts for sanitary inspection purposes and routine inspections on the initiative of the department were instituted.

Public utilities.—The public water supply owned by the city is derived from the Tennessee River, and treated by coagulation, rapid sand filtration, and chlorination before being served to 97 per cent of the population. Laboratory examinations of the treated water showed *B. coli* present in 0.4 per cent of the 10 cubic centimeter samples. The separate type of sewerage system is employed and was accessible for half the population. Sewage is discharged untreated into the Tennessee River. Approximately 50 per cent of the population used privies, which are chiefly of the pit type.

Public-health education.—There is no organized effort for public-health education by official agencies.

Special comment.—There is need for an increased health appropriation to provide for a comprehensive health program in Knoxville, and a staff adequate for the control of communicable diseases according to standards approved by the American Public Health Association. Prompt reporting of all communicable diseases should be encouraged, and a program of antituberculosis work should be developed. There are several voluntary organizations active in public-health work in the city. An effort should be made to secure correlation of these activities with those of the official health department. The program for protection of maternity and infancy should be extended. School health supervision should provide for children of the parochial schools as well as those of the public schools, and continuous records of defects found and corrected should be maintained for each child. Pasteurization of milk should be required. An active campaign of public health education should be instituted. It is understood that many of the above suggestions have received consideration since the health department was reorganized in 1924.

LAWRENCE, MASS.

Lawrence is an industrial city of 97,287 population, 58.3 per cent of whom are native white, 38.5 per cent foreign born, and 3.2 per cent colored. The population per square mile was stated to be 13,620. The total taxable valuation was \$1,186 per capita.

Administration.—A mayor and council govern the city. There is a paid board of health of three members, appointed by the director of public health and charities. The director of public health and charities is elected by the citizens at a salary of \$2,300 per annum for a period of two years.

Expenditures.—The total health-department expenditures amounted to \$3.83 per capita in 1923, including \$2.62 for garbage collection and disposal, \$0.51 for hospitals, \$0.68 per capita for health service, and \$0.02 for plumbing inspection.

Vital statistics.—Registration of vital statistics is conducted by the city clerk and is in accord with the State regulations of Massachusetts. It is considered probable that 95–97 per cent of the births and 100 per cent of the deaths are reported.

Communicable-disease control.—Reporting of the principal communicable diseases is fairly satisfactory except for diphtheria, only 9 cases for each annual death on the average having been reported as compared with a standard of at least 15 as an indication of completeness. There are 55 hospital beds per 100,000 population, 15 beds being set aside for cases of typhoid, diphtheria, and scarlet fever. About 99.5 per cent of the school children have been vaccinated against smallpox, and 1,058 children have been Schick tested.

Tuberculosis.—The fact that only 111 cases of tuberculosis were reported with 70 deaths is an indication of incompleteness of reporting of this disease. There were 356 clinic patients, while 3,147 nurses' visits were made to homes. A total of 85 hospital beds is available in county sanatoria.

Venereal disease.—Reporting, in accordance with State regulations, is by office number to the State department, only lapsed cases being reported to the local department. There were 66 cases of syphilis and 104 cases of gonorrhea reported during the year, while 2,527 visits were made to the venereal-disease clinic conducted by the health department.

Child hygiene.—One prenatal clinic is conducted at the Lawrence General Hospital. There is no information concerning the proportion of births attended by midwives, in view of the fact that their practice is illegal in the State. Of the 2,698 live births during the year 533 occurred in hospitals. There are four infant-welfare clinics, which were attended by 1,064 children under 2 years of age, who made 3,404 visits. A total of 18,764 nurses' visits were made on behalf of children of preschool age. Health supervision of children of the public and parochial schools is carried on by the health department, there being provided 1 nurse for 1,847 pupils, and 1 physician for 3,374 pupils. A complete physical examination is given annually to children of elementary grades, 30,006 examinations having been made during the year, but the records of defects corrected are not complete. Children applying for working papers must pass a physical examination made by a school physician before being issued a certificate. The division of mental hygiene of the State department of mental diseases operates one weekly habit clinic in the city.

Industrial hygiene.—Industrial-hygiene work is carried on by individual concerns only.

Public-health nursing.—There were 19 nurses provided by the health department, and 7 by the district nursing association, giving a ratio of 26.7 nurses per 100,000 population.

Laboratory.—A total of 1,438 laboratory examinations was made on specimens of typhoid, tuberculosis, diphtheria, and gonorrhea.

Food and sanitation.—There is no record of the number of dairies producing milk for the city, and health-department supervision of milk plants and distribution is limited. Eighty-five per cent of the supply was Pasteurized. The total per capita consumption amounted to 1.1 pints daily. Inspections are

made of foodstuffs and methods of handling. General sanitary inspections are limited to efforts to abate nuisances. Plumbing inspection is still considered a function of the board of health.

Public utilities.—The public water supply owned by the city is derived from the Merrimack River and is treated by slow sand filtration and chlorination before being served to all the people. It was stated that 30 per cent of the laboratory analyses of treated water showed *B. coli* present in 10 cubic centimeter samples. Both combined and separate systems of sewerage are employed and accommodated 98 per cent of the population, the sewage being discharged untreated into the Merrimack River.

Public-health education.—Monthly statistical bulletins are published, and the health officer utilizes the press weekly.

Special comment.—A larger health appropriation is needed for health-promotion activities. This should include an extension of the antituberculosis program and increased activity for the early reporting and treatment of venereal disease. Increased prenatal care should be given and efforts made to secure the registration of a larger number of babies at infant-welfare clinics. This calls for an increased nursing staff. Closer supervision should be given the milk supply, and Pasteurization should be required. Public-health education activities might well be extended.

LOS ANGELES, CALIF.

The population of Los Angeles was 674,641, classified as 76.7 per cent native white, 19 per cent foreign born, and 4.3 per cent colored. The city covers an area of 407.2 square miles, giving a population per square mile of 2,610. The total taxable valuation was \$1,162 per capita.

Administration.—The city government under a mayor and council provides for no board of health. There is no advisory council. The health commissioner at the time of the survey had held office 31 years. This position is not under civil service but is filled by appointment by the mayor for a four-year term at a salary of \$4,800. Broad administrative powers are given the health commissioner.

Expenditures.—The health department expenditures in 1923 amounted to \$0.56 per capita, \$0.02 per capita being for hospitals, leaving \$0.54 for health purposes. In 1920 the expenditures for health purposes amounted to \$0.52 per capita.

Vital statistics.—Registration of vital statistics is a function of the health department and conforms to modern procedure. Approximately 90 per cent of the births and 100 per cent of the deaths are reported and systematically checked and verified.

Communicable-disease control.—The ratio of reported cases to deaths for diphtheria, scarlet fever, and measles is creditably high, but only 6.8 cases of typhoid per death and 12.7 of whooping cough per death are reported to the health department. Cases of measles, mumps, and whooping cough are not visited by representatives of the health department. Gaseous fumigation is still practiced after cases of diphtheria, scarlet fever, smallpox, cerebrospinal meningitis, acute anterior poliomyelitis, and tuberculosis.

Tuberculosis.—There were 3,181 cases reported with 1,104 deaths. Three clinics are provided for diagnostic and treatment purposes, and 4,111 patients were on the active records during the year as having made 44,581 clinic visits, while 14,347 visits were made by nurses in behalf of tuberculosis cases. There were 1,465 admissions to sanatoria during the year.

Venereal diseases.—Reporting in accordance with State law is by office number to the local health department. There were 3,269 cases of syphilis and 2,536 cases of gonorrhea reported during the year. Two clinics are maintained, one for men and one for women, where 674 cases of syphilis and 959 cases of gonorrhea were treated. There are 70 hospital beds available for special cases. Four nurses and one social-service worker were engaged in clinic and follow-up work.

Child hygiene.—Prenatal clinic service is available and 5,978 visits were made by expectant mothers. Midwives are registered in accordance with State law. There are 22 infant-welfare stations located in various sections of the city, and 3,457 children under 2 years of age paid 17,929 clinic visits. A total of 17,226 health-department nurses' visits were made in behalf of infants of this age period. Health supervision of children of the public schools is conducted by the board of education. A complete physical examination is made of children of all grades as soon as possible after admission and yearly thereafter. Records of defects corrected are not complete. There is 1 nurse on the average for 3,654 pupils. Children applying for working papers must pass a physical examination before receiving a certificate. There is no official activity for the promotion of mental health.

Industrial hygiene.—Certain of the larger industries employ physicians and nurses for industrial hygiene work, but health-department activities are limited to sanitary inspections.

Public-health nursing.—There is a separate bureau of public-health nursing, with a special supervision of nurses. In all, 50 nurses were provided by the health department and 45 by the board of education, giving a total of 14.1²³ nurses per 100,000 population.

Public-health laboratories.—A public-health laboratory established in 1899 provides for the examination of diagnostic specimens and for milk and water analyses, a total of 8,520 laboratory operations having been recorded for the year.

Food.—Dairies producing milk for the city are inspected and scored regularly, 17,595 inspections having been made. All herds from which raw milk is sold must be tuberculin tested. There are 4 dairies producing certified milk under the supervision of a county medical milk commission, and 87 per cent of the total supply was Pasteurized. The total per capita milk consumption amounted to 1.1 pint daily, which is a creditable record. Food establishments are regularly inspected but not scored.

Sanitation.—General house-to-house inspections are made in addition to inspections for the abatement of nuisances which are made as a result of citizens' complaints. Special measures are directed against fly and rat breeding.

Public utilities.—The public water supply, owned by the city, is derived from rivers and is treated by chlorination before being served to 98 per cent of the population. Laboratory analyses of the treated water showed *B. coli* present in 3 per cent of the 1 cubic centimeter samples. The separate system of sewerage was accessible for 95 per cent of the population, all the sewage being treated by fine screening and a portion by sedimentation in Imhoff tanks before discharge of the effluent into the harbor.

Public-health education.—An annual report of 3,000 copies is published, but otherwise there is no public-health educational work carried on by the department.

²³ Exclusive of about 10 nurses employed by private agencies.

Special comment.—Progress has been made since 1920 in the extension of the health program, including child hygiene, but health supervision of school children should be extended to those of the parochial schools. An increased appropriation to make possible a still broader health department program, including a larger salary for the health officer, and the development of health-education activities is needed. Measures for the control of communicable diseases should conform more closely with the standards of the American Public Health Association. Supervision of midwives should be exercised.

LOUISVILLE, KY.

Louisville is largely an industrial city, with a population of 257,671. The population per square mile is 6,794. The total taxable valuation amounted to \$1,217 per capita.

Administration.—A mayor and council govern the city. There is an advisory council of three members appointed by the county medical society for an indefinite term. The health officer is appointed by the mayor for a term of four years on a full-time basis at a salary of \$4,000. The appointment and dismissal of subordinates and the hearing of appeals from orders are duties of the board of public safety, while the city council fixes salaries and makes rules and regulations.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.34 per capita, \$0.02 of which was spent for medical relief of the poor, and \$0.01 for mosquito control. In 1920 the entire expenditure of the department, amounting to \$0.36 per capita, was devoted to health purposes proper.

Vital statistics.—The collection of vital statistics is a function of the State board of health. It is presumed that 90 per cent of the births and 100 per cent of the deaths are reported. No published reports are issued.

Communicable-disease control.—Reporting of cases of communicable disease to the health department seems to be more complete than in the average city as judged by the ratio of cases to deaths. Approximately 11,500 persons were actively immunized against diphtheria during the year. Ten per cent of the cases of typhoid, 5 per cent of the cases of diphtheria, 4 per cent of the cases of scarlet fever, and 100 per cent of the cases of smallpox are hospitalized. Approximately all the school children are vaccinated against smallpox.

Tuberculosis.—A total of 808 cases of tuberculosis with 297 deaths was reported. The city and county board of the tuberculosis hospital maintains a clinic and provides for home-nursing work. There are 130 beds for adults and 60 beds for children available at the State sanitarium, and 340 patients were admitted during the year. A total of 9,082 visits by nurses were made in behalf of tuberculosis cases during the year, while 1,657 clinic patients were on the active records as having made 3,308 visits to clinics.

Venereal diseases.—There were 238 cases of syphilis and 540 cases of gonorrhea reported to the health department, and clinic facilities are provided at the city hospital dispensary.

Child hygiene.—Nurses' visits in behalf of prenatal cases numbered 5,550. There were 1,245 prenatal cases registered, who paid 2,025 visits to clinics. Children under 2 years of age visiting clinics numbered 3,508, a total of 10,377 visits having been made, while 37,565 nurses' visits were made in behalf of children of these age groups. School-health supervision is carried on by a staff of 6 part-time physicians and 6 full-time nurses. A complete physical examination, including heart and lungs, is made once a year. A total of 12,702 defects were found as the result of 71,483 examinations, and 6,015 defects were reported as corrected. A physical examination of children applying for work-

ing papers is required and 630 certificates were issued during the year. The Louisville Society for Mental Hygiene, with the support of the community chest, operates a psychological clinic.

Industrial hygiene.—Inspection of factories is a function of the health department, the division having been organized in February, 1923. In addition, several concerns employ medical and nursing personnel.

Public-health nursing.—There is central supervision of nurses in Louisville. Eleven nurses were employed by the health department, 29 by the public-health nurse association, and 5 by the tuberculosis clinic, giving a ratio of 17.4 nurses per 100,000 population.

Laboratory.—A public-health laboratory is maintained where 19 examinations per 1,000 population were made during the year, in addition to a large number of bacteriological and chemical examinations of milk, bacteriological examinations of water, and chemical examinations of liquor (for the police department).

Food.—A total of 2,185 inspections was made of dairies producing milk for the city. Tuberculin testing of herds for milk which is to be sold raw is required. The 51 milk plants, in which 85 per cent of the supply was Pasteurized, are inspected semimonthly. The per capita milk consumption amounted to 0.9 pint daily. Inspections of food-handling establishments are made at intervals, and permits are issued to meat dealers.

Sanitation.—Routine house-to-house inspections are made in some parts of the city in addition to the general sanitary inspections made as a result of citizens' complaints for the abatement of nuisances. Housing inspection is a function of the health department. Local provisions require that manure be kept in screened bins and be removed during summer months. Measures for the prevention of mosquito breeding are in the form of oiling and ditching of ponds and cutting of weeds along the banks.

Public utilities.—The public water supply, owned by the city of Louisville, is derived from the Ohio River and is treated by sedimentation, coagulation, rapid sand filtration, and chlorination before being served to 90 per cent of the population. The separate system of sewerage is employed and was accessible for 75 per cent of the population, the sewage being discharged untreated into the Ohio River.

Public-health education.—Special pamphlets on various diseases are issued by the health department and the health officer utilized the press occasionally for health stories.

Special comment.—There is need for increased appropriation to provide for additional personnel in the health department, for increased activities in the control of communicable diseases, particularly tuberculosis and venereal diseases, and for the extension of child hygiene work under official auspices. Increased nursing staffs are also needed for school health work. During the year 1924 a careful survey of the hospitals and health facilities of Louisville was made under the auspices of the Louisville Community Chest, and a report of this survey has been published.

LOWELL, MASS.

Lowell is an industrial city of 115,087 people, of whom 59.8 per cent are native white, 40 per cent foreign born, and 0.2 per cent colored. The city occupies an area of 14.1 square miles, giving a population per square mile of 8,162. The taxable valuation amounted to \$1,186 per capita.

Administration.—A mayor and council govern the city. There is a paid board of health of three members appointed by the mayor, with confirmation

by council, to serve for a term of three years. One member must be a physician, but none of the three shall be members of the city council. Weekly meetings are held, the function of the board being to formulate policies, issue orders and regulations, and prepare the budget. The agent and secretary of the board is appointed by the board under State civil service on a full-time basis at a salary of \$2,657 a year.

Expenditures.—The total expenditures of the health department in 1923 amounted to \$1.55 per capita, but of this amount \$0.43 was for hospitals, \$0.41 for garbage disposal, and \$0.04 for plumbing, leaving \$0.67 for health purposes. Of the total expenditures of \$1.55 per capita in 1920, \$0.29 was spent for health services proper, \$0.10 for hospital service, and \$1.16 for garbage and refuse service.

Vital statistics.—The State law concerning the collection of vital statistics is enforced, the work being handled locally by the city clerk. Reports of births are probably 97 per cent complete, while all deaths are considered reported.

Communicable diseases.—Reports of typhoid and diphtheria cases are evidently incomplete, as shown by the low ratio of cases to deaths, an average of only 3.3 cases of typhoid and 8.5 cases of diphtheria being reported. Epidemiological cards are kept for eight diseases, but spot maps and chronological charts are not utilized. Only half the beds usually considered necessary (total 27) is available for communicable-disease cases, and this is reflected in the low percentage of cases of diphtheria (12.5 per cent) and scarlet fever (11 per cent) hospitalized. Practically 100 per cent of the school children have been vaccinated.

Tuberculosis.—There were 194 cases with 100 deaths reported. A tuberculosis clinic is operated by the health department, where 496 patients, 204 of these new patients, came for diagnosis and treatment. In all, 4,720 visits to homes were made by the two nurses of the health department and tuberculosis council. There were 95 patients admitted to city and county hospitals and sanatoria during the year.

Venereal disease.—In accordance with the State law, cases are reported by office number to the State department, only lapsed cases being reported by name and address to the local health department. There were in all 36 cases of syphilis and 138 cases of gonorrhea reported during the year, while 425 patients (131 new patients) were registered at the health department clinic as having made 3,764 visits.

Child hygiene.—A prenatal clinic is maintained where 73 expectant mothers were registered, 1,000 nurses' visits having been made in behalf of prenatal cases. The number of births attended by midwives is not known, as midwives are not recognized in the State. Of the 2,947 live births, 645 occurred in hospitals. There were 1,629 children under 2 years of age registered at the four infant-welfare clinics of the Lowell Guild as having paid 4,719 visits to clinics, 19,887 home visits having been made by nurses. The children of preschool age receiving attention, 547 in number, are those in families to which visits are made by the nurse in connection with baby-hygiene work. Health supervision of children of the public and parochial schools is carried on by the health department, a full-time director of school hygiene being employed. A complete physical examination is given on admission to children of all elementary grades, and to those in the first-year class of high school, while children who are underweight or have cardiac conditions are examined periodically during the year, as are those returning after scarlet fever and diphtheria. A total of 27,765 examinations were made during the year, with 23,957 defects found, and 2,375 defects corrected. To determine the physical fitness of chil-

dren applying for working papers, an examination is required made by the director of school hygiene. There are no special mental-hygiene activities in the city.

Industrial hygiene.—All diseases arising from occupation are reportable in the State. One factory inspector is employed by the State in this district, but there are no activities in this field by local official agencies.

Public-health nursing.—There were 18 nurses provided by the health department, 10 by the Lowell Guild and Tuberculosis Council, and 12 by industrial firms. Exclusive of the industrial nurses there are 24.3 nurses per 100,000 population.

Laboratory.—There were 904 examinations of diphtheria culture, 470 of tuberculosis smears, 47 of typhoid specimens, 66 of gonorrhea smears, and 5 miscellaneous examinations in the laboratory.

Food.—There were 264 dairy inspections made during the year and 52 per cent of the milk supply was Pasteurized. The per capita milk consumption amounted to 0.75 pint, or three-fourths of the desired standard. Inspections are made of foodstuffs and methods of handling.

Sanitation.—General inspections are made of housing, plumbing, and waste disposal. Garbage collection is conducted by the health department, a portion of the garbage being sold to farmers for hog feeding at \$1 a load, the remainder being dumped and covered. Stables are licensed by the health department.

Public utilities.—The public water supply, owned by the city, is derived from wells, and treated only for iron and manganese removal. All the people were served with this supply. Laboratory supervision is maintained by the board of public service and the State department of health. The sewerage system is largely of the combined type and was accessible for 90 per cent of the population. The sewage is discharged untreated into the Merrimac River.

Public-health education.—There is no organized campaign of public-health education. An annual report of 500 copies is published, and the daily press is utilized by the health department, while occasional lectures are given by the director of school hygiene.

Special comment.—Progress has been made since 1920 in developing child-hygiene work. Prenatal, infant, and preschool activities should be extended, increased facilities should be provided for hospitalization of communicable diseases, Pasteurization of milk should be required, and health education developed. The laboratory service should be extended.

LYNN, MASS.

Lynn is an industrial city of 102,683 people, classified as 71.1 per cent native white, 28.1 per cent foreign born, and 0.8 per cent colored. The population per square mile is 9,034. The total taxable valuation amounted to \$1,039 per capita.

Administration.—The city is governed by a mayor and council. There is no board of health nor advisory council. The commissioner of public health is appointed by the mayor, with confirmation by council, for a term of three years on a part-time basis at a salary of \$2,500. He has the power of appointment and dismissal of subordinates and, with the approval of the mayor, of fixing salaries, while the health department, with the approval of council and attorney general of the State, makes rules and regulations.

Expenditures.—The expenditures in 1923 by the health department amounted to \$1.19, of which 87 cents were for hospital service and 2 cents for plumbing

inspection. In 1920, 94 cents were expended, 60 cents being for hospital service.

Vital statistics.—The city clerk has charge of registration of births and deaths. It is probable that 90 per cent of the births and 100 per cent of the deaths are reported. Tabulations are made weekly, with classification by nativity, sex, age, and cause, and monthly reports are issued.

Communicable-disease control.—Aside from a low ratio of the number of typhoid cases for each death (3.6), reporting of the principal epidemic diseases is reasonably complete. There are 47 hospital beds per 100,000 population available for cases of communicable diseases. Ninety-five per cent of the school children have been vaccinated against smallpox, while diphtheria immunization measures have been recently undertaken.

Tuberculosis.—There were 266 cases with 65 deaths reported. Nurses' visits in behalf of tuberculosis cases numbered 413, while there were 190 clinic patients who paid a total of 212 visits to the clinic under the supervision of the attending physician at the tuberculosis hospital at the Lynn Sanatorium, where 50 beds are available for adults, while 96 patients were admitted during the year.

Venereal diseases.—There were 29 cases of syphilis and 104 cases of gonorrhea reported, while 301 new cases visited the clinic maintained by the State at the Lynn Hospital.

Child hygiene.—The Lynn General Hospital maintains a clinic for expectant mothers who are to be confined at the hospital, 135 such cases having averaged two visits each in 1923. It is stated that midwives, who are not licensed, attended 3 per cent of all births. There are three infant-welfare clinics maintained by the child-welfare and day-nursing organization of Lynn, to which 2,782 visits were made by 730 children, while 5,015 nurses' visits were made to homes. Nurses' visits in behalf of children aged 2 to 5, inclusive, numbered 212. Health supervision of children of the public and parochial schools is carried on by the health department. A complete physical examination is given children of the first four grades once a year. A total of 5,550 examinations was made, and 1,517 defects discovered, while a total of 997 defects were reported corrected during the year. Children applying for working papers are first required to pass a physical examination.

Industrial hygiene.—There are no activities in this field of local official agencies.

Public-health nursing.—Six nurses were employed by the health department, and four by private agencies.

Laboratory.—A total of 3,906 laboratory examinations was made during the year, 1,771 of these being milk analyses, 1,367 examinations for diphtheria, 361 examinations for tuberculosis, 11 examinations for gonorrhea, while the remaining examinations were of ice cream, cream, vinegar, and butter.

Food and sanitation.—Seventy-five per cent of the milk supply was Pasteurized. Tuberculin testing is required made only of herds from which certified milk is sold. Inspections are regularly made of food-handling establishments and licenses are issued to restaurants. House-to-house inspections are made in routine for the improvement of sanitary conditions and the abatement of nuisances.

Public utilities.—The public water supply, owned by the city, is derived from rivers and ponds and is stored before being served to all of the people. Laboratory supervision is exercised by the State department of health, samples being taken once a month. The sewerage system is largely of the combined type and was accessible for 70 per cent of the population.

Public-health education.—There is a monthly bulletin of 300 copies. The health commissioner utilizes the press once a month for general health items.

Special comment.—Expenditures for health purposes are insufficient to obtain adequate modern health administration for this city. A more complete program is needed for the protection of maternity and infancy, reaching the preschool and school periods. Pasteurization of all milk not from tuberculin-tested herds should be a requirement, and health education should be developed according to an organized plan as soon as funds and personnel permit. Closer laboratory supervision of the water supply locally would be an added safeguard for the public.

MANCHESTER, N. H.

Manchester is an industrial city of 81,384 people, classified as 64.9 per cent native white, 35 per cent foreign born, and 0.1 per cent colored. The population per square mile is 2,401. The total taxable valuation amounted to \$1,348 per capita.

Administration.—The city is governed by a mayor and board of 13 aldermen. There is a paid board of health of three members appointed by the mayor for overlapping terms of three years each. The medical health officer is appointed by the board of health for an indefinite term on a full-time basis at a salary of \$3,600 and maintenance. The health officer also serves as superintendent of the isolation hospital. The appointment and dismissal of subordinates is a function of the board of health, which accepts recommendations of the health officer. The fixing of salaries is a function of the board of health, subject to the approval of the finance commission. The board of health has the power to make rules and regulations, subject to the approval of the mayor and aldermen.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.87 per capita, which sum includes \$0.31 for maintaining the isolation hospital.

Vital statistics.—The registration of vital statistics is conducted by the city clerk. The International List of Causes of Death is utilized and certificates are checked and verified for completeness and accuracy. Over 90 per cent of the births and probably all the deaths are reported. Published reports are issued annually.

Communicable-disease control.—Measures for the control of communicable diseases conform to accepted standards. Cases of typhoid or paratyphoid among food handlers are released from isolation not less than three months after all signs and secondary or complicating infections have disappeared, and not then unless three successive negative cultures have been taken. Practically all of the school children have been vaccinated against smallpox. The use of the Schick test and toxin-antitoxin for the immunization of susceptible individuals against diphtheria has recently been undertaken. There is an average of 78 beds per 100,000 population for the hospitalization of communicable-disease cases.

Tuberculosis.—A total of 156 cases, with 69 deaths, was reported. Nurses' visits in behalf of tuberculosis cases numbered 4,132, while 1,340 patients attended clinics, having made a total of 1,765 visits during the year. There were 71 admissions from the city to hospitals and sanatoria during the year.

Venereal diseases.—There were 40 cases of syphilis and 81 cases of gonorrhea reported. A total of 357 old cases and 117 new cases were under treatment, having paid a total of 5,897 visits to the clinic maintained by the State and local health departments.

Child hygiene.—Infant-welfare and child-hygiene work are carried on under the supervision of the health officer. Nurses' visits in behalf of prenatal cases numbered 379, while 218 prenatal cases visited clinics. Midwives, who attended 7 per cent of the births, are licensed by the health department. Three infant-welfare clinics are conducted by the health department, where 1,648 infants were registered during the year. Visits to children of this age period by health-department nurses numbered 16,278, in addition to 8,480 home visits made by other nurses of the city. The health department has charge of all medical work in the schools and gives complete physical examination to children of the kindergarten, the first, fourth, and eighth grades once a year. A total of 5,902 examinations was made in 1923 and 1,622 defects discovered. School dental service for dental examinations and treatments is conducted by the health department. A total of 6,178 examinations was made and 5,662 treatments given. Children applying for working papers are required to pass a physical examination given by a school physician before being given working certificates. There were 835 certificates issued during the year.

Industrial hygiene.—This work is confined to activities of individual industrial concerns.

Public-health nursing.—Thirteen nurses were employed by the health department, one by the State, and 16 by other agencies in the city, giving a ratio of 36.8 nurses per 100,000 population.

Laboratory.—In the laboratory maintained at the isolation hospital there were made 1,750 examinations for diphtheria, 15 examinations for tuberculosis, and 35 examinations for gonorrhea, in addition to 5 miscellaneous specimens. The State laboratory examines water samples, Wasserman specimens, foods, drugs, bacteriological specimens, and pathological specimens.

Food and sanitation.—Systematic supervision is exercised over the milk supply, through inspections of dairy farms and milk plants, and laboratory analyses by the milk inspector. Seventy-six per cent of the milk supply was Pasteurized. The per capita milk consumption amounted to 0.8 pint daily. Inspections are regularly made of food establishments, and licenses are issued to establishments manufacturing sausages and to slaughterhouses. General sanitary inspections are made on the initiative of the department as well as in the follow-up of citizens' complaints for the abatement of nuisances.

Public utilities.—The public water supply, owned by the city, is derived from Lake Massabesic, treatment consisting of storage. Approximately 98 per cent of the population was served by the public supply. The combined system of sewerage is employed and was accessible for 98 per cent of the population, the sewage being discharged untreated into the Merrimac River.

Public-health education.—The health officer publishes an annual report, utilizes the press, and delivers occasional lectures on public-health topics before associations. Exhibits were prepared for use during health week in May, during which time health talks and moving pictures were shown in the schools and theaters.

Special comment.—In June, 1921, the board of health engaged a medical health officer as the executive officer of the health department to have direction of all department activities. Considerable progress has been made in the extension of the prenatal and infant-welfare programs since 1923, as well as in the adoption of a new ordinance for food and milk control. There are needed increased beds for the hospitalization of incipient cases of tuberculosis. In view of the fact that public water supply from surface sources is a poten-

tial source of danger unless treated, it is also desirable that the water be treated by chlorination or other satisfactory means before being served to the public.

MEMPHIS, TENN.

Memphis had a population of 170,067, classified as 59.9 per cent native white, 3.6 per cent foreign born, and 36.5 per cent colored. The city occupies an area of 25.3 square miles, giving a population per square mile of 6,722. The taxable valuation was \$1,191 per capita.

Administration.—The city government consists of five commissioners, the mayor being the commissioner of public health and public affairs. The superintendent of health is appointed by the mayor for a term of two years at a salary of \$4,000. As professor of public health at the University of Tennessee, he receives an additional \$2,000. The superintendent of health has complete authority and responsibility for his department.

Expenditures.—The per capita expenditure in 1923 by the health department amounted to \$0.65, including \$0.04 for mosquito control and \$0.01 for gift to the associated charities, leaving \$0.60 for health purposes as compared with \$0.65 in 1920.

Vital statistics.—The collection of vital statistics was conducted by a local registrar of the State health department until June, 1924, when the superintendent of health was appointed local registrar. The city is in the registration area for deaths, but not for births. No statistical reports have been issued.

Communicable-disease control.—Reporting of communicable diseases by physicians to the health department is more completely carried out than in the average city. General measures for control follow accepted standards, except for the release of convalescents from typhoid fever without first securing negative stools and urine cultures. Over 99 per cent of the school children have been vaccinated. Spot maps and chronological charts are used for the principal communicable diseases. Sixty per cent of the cases of typhoid, 10 per cent of the cases of diphtheria and scarlet fever, and 100 per cent of the cases of smallpox are hospitalized.

Tuberculosis.—There were 623 cases with 283 deaths from tuberculosis reported, but the number of deaths includes many nonresidents. A total of 120 beds is available for adult cases with none for children,²⁴ while 115 patients were admitted to hospitals during the year. One nurse was provided in 1923 for field work. There were 1,758 home-nursing visits per 100,000 population, with 75 visits per 100,000 population to clinic. An attendance of 140 children in open-air schools is reported.

Venereal diseases.—Reporting in accordance with State and municipal law is by office number to the State department. Reporting is more complete than the average, as shown by the fact that 1,488 cases of syphilis, 411 of gonorrhea, and 47 other cases were reported. Clinic facilities are provided at the General Hospital, where 2,344 cases of syphilis, 904 cases of gonorrhea, and 378 other cases were treated. The social-service worker in the health department follows up all clinic cases and, in addition, a certain number reported by name.

Child hygiene.—Child-hygiene work is organized under a division of child hygiene, a division of school inspection, and a division of dental hygiene in the health department. Of 4,217 live births, 13 per cent were delivered by midwives who are supervised by the health department. There were 210 deliveries in the hospitals of the city. Nursing visits to prenatal cases num-

²⁴ At present (1925) there is a bed capacity of 250 for cases of tuberculosis, approximately 50 of which are for children.

bered 133 per 1,000 births, while a total of 927 prenatal cases visited clinics. The number of visits to four clinics by children under 2 years of age was 275 per 1,000 live births, while 4,964 (1,200 per 1,000 births) nurses' visits were made to infants. School-health supervision is carried on by the health department, there being one physician to 8,700 pupils and one nurse to 2,300 pupils. A complete physical examination is given all grade school children every two years. Of 7,902 defects found, 3,488 are reported as corrected. It is the present policy of the department that all physical examinations shall be made by physicians and dentists and that records, home visits, and follow-up work shall be carried on by the nurses. No special physical examination is required of children applying for working papers. There is no special activity for the promotion of mental health, although a child's guidance clinic is in process of organization under official auspices.

Industrial hygiene.—There is no special activity by the city in industrial-hygiene work.

Public-health nursing.—Each division of the health department requiring nurses has its own nursing staff, there being 22 in all. In addition, 25 nurses were provided by the home-nursing staff of the General Hospital, 4 by industrial concerns, and 1 by a voluntary organization, giving a ratio of 28.2 nurses per 100,000 population, exclusive of the industrial nurses.²⁵

Laboratory.—A well-equipped laboratory is maintained for bacteriological and chemical examinations. These include 2,675 examinations for malaria made in cooperation with the field investigations of the United States Public Health Service. A total of 41,090 examinations was made during the year.

Food.—The dairies producing milk for the city are inspected and scored by the dairy inspectors of the health department once a month, a total of 4,562 inspections having been made during the year. Ninety-five per cent of the cows were tuberculin tested, this being a requirement for the production of raw milk. Pasteurization is not required, but the process is regulated where practiced, 46 per cent of the supply being Pasteurized. The per capita daily consumption amounted to 0.65 pint. Inspections are regularly made of all food-handling establishments.

Sanitation.—General house-to-house inspections are made in routine twice a year on the initiative of the department, in addition to sanitary inspections as the result of citizens' complaints for the abatement of nuisances. Special measures are directed against the breeding of flies and mosquitos. Antimalaria work is carried on by the health department in and around the city.

Public utilities.—The public water supply owned by the city is obtained from deep wells. The water is aerated for the removal of carbon dioxide, filtered by the rapid-sand filtration process to remove iron compounds and then chlorinated. This supply served 97 per cent of the population. Regular laboratory analyses are made and show the well water to be in excellent condition. The separate system of sewerage is employed, the sewage being discharged untreated into the Mississippi and Wolf Rivers. Practically the entire city (97 per cent) was sewered, except for a section recently admitted to the city.²⁶

Public-health education.—A complete report of all health work since 1880 has recently been prepared and is in the process of publication. Special reports

²⁵ All field health-nursing work, including that of the Metropolitan Life Insurance Co., is now (1925) directed by the department of health, while the generalized district plan is being instituted throughout the city, with 35 nurses on active duty, of which 12 are colored.

²⁶ Contracts call for the completion of sewer lines by Oct. 15, 1925, for the entire city, with the exception of a small area containing 100 houses.

as a result of the survey of Memphis' milk supply and of the causes of violent deaths in Memphis have been published since 1923. Circulars on health topics are issued from time to time, and lectures are given frequently by the superintendent of health and division chiefs. Exhibits on child hygiene, milk, insects, and general health topics have been prepared and utilized. A training course is given to department nurses and sanitary inspectors 1 hour each week for a period of 12 weeks. Special articles on general public-health work are prepared for the members.

Special comment.—Progress has been made since 1920 in providing for the care of maternity and infancy and in the extension of school-health supervision, while public-health education work has been extended. Although a large proportion of the milk comes from tuberculin-tested herds, Pasteurization should be required for protection against communicable diseases other than tuberculosis. Control of typhoid fever should be undertaken by culture before release or isolation. The immunization of preschool children as a protection against diphtheria might well be encouraged.²⁷

MILWAUKEE, WIS.

Milwaukee is an industrial city of 484,595 population classified as 67.2 per cent native white, 29.8 per cent foreign born, and 3 per cent colored. The city occupies an area of 26.9 square miles, giving a population per square mile of 18,000. The total taxable valuation amounted to \$1,537 per capita.

Administration.—A mayor and common council govern the city. There is no board of health nor advisory council. The commissioner of health is appointed on a full-time basis by the mayor, subject to ratification by the common council. His term of office is four years, at a salary of \$6,000 a year. Appointments are made by the commissioner from a list prepared by the civil service commission. The fixing of salaries is a function of the council, while the commissioner makes rules and regulations subject to ratification by this body.

Expenditures.—The per capita health expenditure in 1923 amounted to \$0.91, of which \$0.19 was for hospitals. This compares with \$0.70 spent for health purposes in 1920.

Vital statistics.—Registration of vital statistics is conducted by the health department, and verification of certificates of births and deaths indicates that 98 per cent of the births and 100 per cent of the deaths are reported.

Communicable-disease control.—Measures for the control of communicable diseases correspond in general with accepted standards of the American Public Health Association. Reporting of the principal epidemic diseases seems to be satisfactory, except for typhoid, the ratio of 6.5 cases per death being 3.5 lower than is to be expected, while only 10.3 cases per death instead of 15 of diphtheria are reported. Over 3,000 children have been Schick tested and approximately one-third this number has been immunized with toxin-antitoxin. There are 39 beds per 100,000 population available for communicable-disease cases.

Tuberculosis.—There were 661 cases of tuberculosis reported with 275 deaths. Clinic facilities are provided and 1,992 patients are registered as having made 5,268 clinic visits. During the year 8,719 home visits were made by nurses to tuberculous cases. At the county sanatoria 350 beds for adults and 100 beds for children are available, and 380 cases were admitted in 1923 from the city.

Venereal diseases.—Reporting according to State law is by office number to the State department, 116 cases of syphilis and 152 cases of gonorrhea having been reported during the year. Clinic facilities are provided in the city hall,

²⁷ This work was undertaken in 1925.

where 116 cases of syphilis and 152 cases of gonorrhea were treated. A social service worker is provided by the State.

Child hygiene.—The bureau of child welfare has two divisions, one devoting attention to prenatal, infant, and preschool activities. Of the 11,692 live births, 28 per cent occurred in hospitals, while the Milwaukee maternity hospital also provided an out-patient obstetrical service. Midwives, licensed by the State board of medical examiners and registered with the local board of health, delivered 12 per cent of the babies, but supervision of midwives is of a limited character. Expectant mothers registered with the visiting nurse association numbered 1,500 and paid 3,199 visits during the year. The health department operates 14 infant clinics in schools, libraries, and elsewhere, which are open two hours a week. There were 2,557 babies registered at these clinics, with 10,333 clinic visits. A nurse visits each new-born baby at least once in addition to the home follow-up clinics, in all, 41,915 home-nursing visits having been recorded by the school hygiene division of the health department. Health supervision is provided for children of public, private, and parochial schools. A complete physical examination is made by a physician of children in the kindergarten, first, third, fifth, and eighth grades. All cases with defects referred by physicians are followed up by nurses. Special classes are provided for the blind, deaf, and for children having speech defects. Forty-five per cent of the defects found were corrected. A complete physical examination is required made by the school physicians of children applying for working papers. All children of 14 to 18 years of age engaged in industry must attend a vocational school one day each week.

Mental hygiene.—A mental-hygiene clinic is carried on under the joint authority of the county and city. This service has the active support of the juvenile protective association, which contributes two special investigators to the local clinic.

Industrial hygiene.—Inspections of sanitary conditions and ventilation are made by three health department inspectors. The remaining activities in this field are performed by the State industrial commission.

Public-health nursing.—There is a division of field nursing in the health department with centralized supervision. The 64 nurses do generalized nursing, except for bedside care, which is provided by the 34 nurses of the visiting nurse association. This gives a total of 98 nurses, or a ratio of 20.2 per 100,000 population.

Laboratory.—A well-organized bacteriological laboratory provides the usual free diagnostic service, and also maintains supervision over the water and milk supplies. A total of 10.7 diagnostic specimens per 1,000 population was made during the year. In the chemical laboratory samples of foods, drugs, milk, water, sewage, and other materials were examined, and milk-plant surveys were made. Sanitary surveys of bathing beaches, swimming pools, and stream pollution were conducted in addition to other activities.

Food.—The four dairy farms producing "inspected" milk are inspected and scored monthly, while the milk plants, in which 98 per cent of the supply was Pasteurized, are inspected more frequently. The total per capita consumption amounted to 0.9 pint daily. Systematic supervision is maintained of all establishments where foods are manufactured or sold. Licenses are issued to persons selling meat, milk, ice, spring water, and garden products.

Sanitation.—General sanitary inspections are made not alone as a result of citizens' complaints for nuisance abatement but also include routine house-to-house inspections, factory inspections, and inspections of schools and rooming houses. Fly-tight receptacles are required for stable manure, with frequent

removal. A special smoke ordinance covering power plants and general nuisance is enforced by the smoke inspector's office and the health department jointly.

Public utilities.—The public water supply serving all the people and owned by the city is obtained from Lake Michigan and is treated by chlorination. It was stated that 14.8 per cent of the 1 cubic centimeter samples of treated water showed *B. coli*. Eighty private wells in use in outlying districts are regularly supervised. The State board of health has the approval of all plans of sewage disposal and water systems. The combined system of sewerage is used in the city, and the sewage was to be treated by the activated sludge process, with the discharge of the effluent into Lake Michigan from near-by rivers. Over 99 per cent of the population was served, there being only 275 privy vaults still in use by less than half of 1 per cent of the population.

Public-health education.—The commissioner of health directs educational and publicity work, publishing a monthly bulletin of 8,000 copies, a weekly health review of 250 copies, and utilizing the daily press. Lectures are frequently given by members of the department on various health subjects to teachers, school children, church and civic organizations.

Special comment.—Progress has been made since 1920 in the extension of supervision of milk supplies and in the enlargement of the scope of school health work. There is still needed a more comprehensive campaign to secure more complete and early reporting and treatment of venereal diseases. A more extensive program of mental hygiene for both children and adults is also needed. Prenatal and preschool activities should be extended.

MINNEAPOLIS, MINN.

Minneapolis is a city of 409,125 people, classified as 83 per cent native white, 16 per cent foreign born, and 1 per cent colored. The city occupies an area of 53.3 square miles, giving a population per square mile of 7,676. The total taxable valuation was \$926 per capita.

Administration.—The city government, under a mayor and council, provides for a department of public welfare administered by a board of 7 members, including the mayor and 2 members elected by and from the city council. A committee of 3 members with a physician as chairman is selected from the board of public welfare to consider public health problems and to act as a directing committee for the commissioner of health, who is appointed by the board to serve for an indefinite term at a salary of \$5,000. The commissioner also has the benefit of an advisory committee of physicians appointed by and from the county medical society. The supervision of the health of teachers and children of the public schools is under the board of education, which employs a director of hygiene, who, at the present time, is also the commissioner of health. The board of education pays the board of public welfare \$3,720, from which sum the commissioner and director receives \$960, the assistant commissioner and assistant director receives \$960, while the supervising nurse is paid \$1,800.

Expenditures.—The health department expenditures in 1923 amounted to \$0.27 per capita, all for health purposes, as compared with \$0.22 per capita in 1920.

Vital statistics.—A section of vital statistics is maintained in the health department and records of births, sickness, and deaths are maintained and utilized. These records are classified according to modern standards. A check upon the completeness of reporting of births and deaths indicates satisfactory results in this regard.

Communicable-disease control.—Measures for the control of communicable diseases conform to modern standards except for the release from isolation of typhoid fever without negative bacteriological examination of stools and urine. Reporting of typhoid, whooping cough, and measles is still somewhat lax, as shown by a comparison of the number of deaths with the number of reported cases of these diseases. Consulting diagnostic service for use by physicians is not maintained by the health department. Although there is no compulsory vaccination law in the State, 67 per cent of the school children have been protected from smallpox. Diphtheria immunization by toxin-anti-toxin administration is encouraged through local physicians. There are 40 beds for hospitalization of communicable diseases per 100,000 population.

Tuberculosis.—A total of 337 deaths with 1,293 cases reported is an indication of better than average reporting. The total number of registered cases at the end of the year was 3,354, and the average number of cases under the care of the health department was 1,871. A total of 410 clinic sessions was held at three tuberculosis clinics in the city maintained at the General Hospital, the University Hospital, and Lymanhurst. These clinics were attended by 1,611 patients, who made 4,933 visits. Excellent sanatorium facilities are provided at the Glen Lake County Hospital (260 beds), the City Hospital at Park View (132 beds), and the Walker State Hospital (60 beds). In addition, there are 20 beds for observation at Lymanhurst; the sum total giving a little better than one bed per annual death.

Venereal diseases.—Venereal diseases are reported in Minnesota by number to the State department of health, and 1,611 cases of syphilis, 2,790 cases of gonorrhea, and 42 other cases were reported from Minneapolis during the year. Day clinics are maintained at the General and University Hospitals, and night clinics by the city. A diagnostic clinic in conjunction with the courts is carried on by the health department. There were 1,546 new admissions with 29,041 treatments given during the year. Educational work is carried on largely by the Woman's Cooperative Alliance and through a carefully prepared program.

Child hygiene.—Of the 9,713 live births in Minneapolis, 93 per cent were attended by physicians, 65 per cent of them occurring in hospitals. Only 6 per cent of the deliveries were made by the 27 midwives, who are registered by the State and who are under the supervision of the State board of medical examiners. Prenatal, infant, and preschool hygiene activities are carried on by the Infant Welfare Society, supplemented by nursing for prenatal cases provided by the visiting nurse organization. A total of 7,942 visits were made to the 6 prenatal clinics of the city, 2 of which are provided by the General Hospital and by the University Hospital, respectively. Over 20 per cent of the women confined were given prenatal care. An average of 4.2 visits per infant was made to clinics, while 29,796 nursing visits were made in behalf of infants under 2 years of age. Preschool clinic service is provided in connection with the work of these private organizations. Health supervision of the children in the public schools is maintained by the board of education. But this work in the parochial and private schools has not been undertaken by the official agencies, although there are three nurses employed in parochial school work. All children of the public schools are examined as soon as possible after admission to school by physicians assisted by the nurses. After admission, children beginning with the kindergarten group through the sixth grade are physically examined during this period of school life. A comprehensive program of dental hygiene is in force. The scope of the work for the supervision of children in industry includes physical examinations and much of the program outlined by the Children's Bureau of the United States Department of Labor. The most important

factor in the mental hygiene field in Minneapolis was the child guidance clinic operated at University Hospital as a demonstration, financed by the Commonwealth Fund through the National Committee for Mental Hygiene. This clinic is later to be maintained in quarters provided at the Lymanhurst Preventorium and to be financed locally. The clinic deals with any type of mental disease or defect involving definite behavior problems referred by schools, physicians, family, welfare workers, and parents. It provides very complete physical, psychological, and psychiatric examinations as needed, with clinic treatment and necessary follow-up in the homes.

Industrial hygiene.—There is no work done in the field of industrial hygiene by the department of health, as the State industrial commission is responsible for this work. Several of the local industrial concerns maintain a special service for their employees.

Public-health nursing.—There were 17 nurses provided by the health department, 54 by the board of education, 17 by the infant welfare society, and 27 by the visiting nurse association, giving a total of 28.6 nurses per 100,000 population. An interesting experiment along the lines of generalized nursing is being made in the sixth ward of Minneapolis, with a population of 11,610, where a generalized staff of 4 district nurses and 1 supervisor with 1 clerk or assistant serves the people of this district with all types of nursing service except communicable disease nursing. The nurses are provided by the board of education, the visiting nursing association, and the infant welfare association.

Laboratories.—There are 28 culture stations where physicians may obtain diagnostic material and leave material for examination. A total of 129 diagnostic examinations per 1,000 population were made during the year.

Food.—Effort is made to inspect the dairy farms producing raw milk for the city annually. Although Pasteurization is not required by law, 95 per cent of the supply was thus treated, the remainder coming from tuberculin-tested herds. All places where foods are sold, prepared, served, or stored, including wholesale cold storage, are inspected and scored.

Sanitation.—Sanitary inspections are performed on the generalized district plan, particular attention being given to nuisance inspection and the supervision of housing conditions in occupied buildings. Provision has been made in the sanitary code for giving the health department the necessary authority to supervise lodging houses. There is an ordinance governing stables which requires the prompt removal of manure to prevent fly breeding.

Public utilities.—The water supply of the city is obtained from the Mississippi River, and the water was used by over 90 per cent of the population after coagulation, sedimentation, filtration, and chlorination. Laboratory examinations of the treated water at the plant and at the health-department laboratory showed low bacterial counts with *B. coli* present in not more than 0.3 per cent of the 10-cubic centimeter samples. The separate system of sewerage was used by 95 per cent of the population, the raw sewage being discharged into the Mississippi River. There were about 100 cesspools and 2,800 privy vaults still in use in outlying districts; but privies are not permitted where water is available for other types of toilet facilities.

Public-health education.—There is at present no organized attempt by the health department to carry on public-health education except through frequent lectures to civic organizations, the use of an annual exhibit at the State fair, and the utilization of the daily press.

Special comment.—Progress has been made in extending the service provided for the care of children from prenatal through school life; but, except for the school health work, these activities are handled by private organizations.

More extensive health supervision for children of parochial and private schools should be provided and systematic health education should be instituted by the health department in conjunction with the excellent service rendered by voluntary agencies. There is needed a more comprehensive program for anti-tuberculosis work and for the control of venereal diseases. One of the greatest needs is for an increased appropriation for health purposes.

NASHVILLE, TENN.

Nashville is a city of 121,128 people classified as 67 per cent native white, 3 per cent foreign born, and 30 per cent colored. The population per square mile was 6,720. The total taxable valuation amounted to \$1,069 per capita.

Administration.—The form of municipal government consists of a mayor and council. The sanitary committee of the chamber of commerce serves as an advisory council. The health officer serves under the supervision of the mayor and a board of public works. The health officer is appointed on a full-time basis for an indefinite period under civil service at a salary of \$3,600 a year.

Expenditures.—The health department expenditures in 1923 amounted to \$0.56 per capita, including \$0.04 for drug dispensary, as compared with \$0.38 devoted to health purposes in 1920.

Vital statistics.—Registration of vital statistics is conducted under the direction of the health department, a registrar being appointed by the State board of health. Checks of certificates indicate that 90 per cent of the births and 100 per cent of the deaths are reported. No published reports are issued.

Communicable disease control.—The ratio of reported cases to deaths for the principal diseases is somewhat lower than the standard accepted by the American Public Health Association as an indication of completeness, there being only 7.7 cases of typhoid, 16 cases of diphtheria, 33 cases of scarlet fever, 45 cases of measles, and 8 cases of whooping cough reported for each death. There are 29 hospital beds per 100,000 population for communicable disease cases. Approximately all of the school children have been vaccinated against smallpox. Gaseous fumigation is still practiced after cases of diphtheria, scarlet fever, and smallpox.

Tuberculosis.—There were 245 cases of tuberculosis with 179 deaths reported. One clinic is maintained by the health department, and a second is soon to be opened. A total of 207 beds (37 for children) are available in county and private sanatoria, 133 cases having been admitted to the county sanatorium during the year. There were 3,667 visits made by the nurses in behalf of tuberculosis cases in 1923, while 542 patients attended clinic.

Venereal diseases.—Reports by office number totaled 696 cases of syphilis, 725 cases of gonorrhea, and 252 other cases. There were treated at the health department clinic 707 cases of syphilis, 473 cases of gonorrhea, and 278 other cases. There were 2 nurses employed in the necessary home follow-up work in addition to 3 social service workers.

Child hygiene.—Five per cent of the births were attended by midwives, who are licensed in accordance with State law. One prenatal clinic is maintained, where 879 visits were made by prenatal cases, while 5,344 nurses' visits were made in behalf of these cases. Nurses' visits in behalf of infants under 2 years of age numbered 23,310, while 1,076 children of this age group attended clinics, having made a total of 5,859 visits. There were 406 preschool children who attended clinics. Health supervision of children of the public schools is carried on by the board of education with a part-time physician as director; one nurse is employed. An effort is made to examine children of the first to

the eighth grades once a year. The total enrollment of children of the public schools is 22,623. There were made 6,324 examinations, and 6,792 defects were discovered, but as the follow-up work on cases was only started in 1922, records are not complete as to the corrections obtained. Children applying for working papers are not required to pass a physical examination. There are no special activities for the promotion of mental health.

Industrial hygiene.—There is no official activity in this field.

Public health nursing.—A division of public health nursing is organized in the health department, which employed 18 nurses, in addition to 1 nurse employed by the board of education and 11 nurses by voluntary agencies, giving a ratio of 24.8 nurses per 100,000 population.

Laboratory.—A public health laboratory is maintained, where 61 diagnostic examinations per 1,000 population were made during the year, in addition to bacterial and chemical examinations of water and milk.

Food and sanitation.—Systematic supervision is exercised over the milk supply, and tuberculin testing of all cattle is required annually. Sixty per cent of the milk supply was Pasteurized. The per capita consumption of milk amounted to 1.1 pints daily. Places where food is handled are regularly inspected. General house-to-house inspections are made twice a year in addition to the follow up of complaints for the abatement of nuisances.

Public utilities.—The public water supply for the city is derived from the Cumberland River, and is treated by coagulation and chlorination before being served to 90 per cent of the population. The combined system of sewerage is employed and was utilized by 77 per cent of the population, the sewage being discharged untreated into the river.

Public-health education.—The health officer prepares special articles for the press about twice a month, delivers an average of 50 lectures on health subjects during the year, and utilizes health exhibits at the State fair. There are facilities for the training of nurses for public health work.

Special comment.—Measures for the control of communicable diseases should be made to conform more closely with standards accepted by the American Public Health Association as desirable. An increased number of beds for tuberculosis patients is needed. The school health supervision program should include children of the parochial schools, and each child should have a complete physical examination, including heart and lungs, at least three times during the school career.

NEWARK, N. J.

The population of Newark was 438,699, with 68 per cent classified as native white, 28 per cent as foreign-born white, and 4 per cent as colored. The area of the city is 23.4 square miles, giving a population per square mile of 18,747. The taxable valuation was \$1,277 per capita.

Administration.—The five administrative divisions of municipal government are each headed by a commissioner, one of whom is mayor. There is no board of health nor advisory council. A full-time medical health officer is appointed by the city commissioners under State civil service, for an indefinite term, at a salary of \$6,500. The appointment and dismissal of subordinates and the fixing of salaries are duties of the mayor and city commissioners, subject to State civil service, but the law otherwise gives the health officer wide powers, especially in matters of contagion, sanitation, and food control.

Expenditures.—The total expenditure of the health department in 1923 amounted to \$0.74 per capita, including \$0.03 for plumbing inspection and \$0.06 for relief of sick poor, as compared with \$0.67 in 1920. In all, \$0.98 were spent for health by the municipality and something over \$0.14 by other agencies.

Vital statistics.—Registration of births and deaths is conducted by the city clerk under the direction of the city commissioners. The International List of Causes of Death is used for classification purposes, and certificates are both checked and verified, with the result that 99 per cent of the births and 100 per cent of the deaths are believed to be reported. Weekly and annual reports are published.

Communicable-disease control.—Measures for the control of communicable diseases are well organized. Gaseous fumigation following cases of diphtheria, scarlet fever, smallpox, cerebrospinal meningitis, and acute anterior poliomyelitis is still practiced. Eighty-eight beds per 100,000 population are provided for cases needing hospital care, and 48 per cent of typhoid cases, 25 per cent each of diphtheria and scarlet fever cases, and 100 per cent of smallpox cases are thus hospitalized.

Tuberculosis.—A total of 1,129 cases of tuberculosis with 406 deaths indicates better than average reporting for cities of this class. Four health department clinics provide 18 hours of diagnostic service weekly (director and 4 physicians), including an evening clinic. Two of these clinics were attended by 1,816 patients who made 18,358 visits, while, in all, 19,887 home-nursing visits by 9 nurses were made in behalf of tuberculosis cases. Available hospital and sanatoria beds number 352 in city, county, and State institutions, and these are always filled.

Venereal diseases.—Reporting of venereal diseases, in accord with legal provisions, is by name and address to the local health department. Diagnosis and treatment are provided at the health department clinic, which, like the tuberculosis clinic, is located adjacent to the bureau. It is open daily, and cared for 806 patients who made 19,299 visits in 1923. The city hospital has 40 beds for venereal disease cases, and 395 persons were cared for during the year. Home and follow-up visits of a social service nature, to the extent of 3,462, were made by the nurse assigned to this work.

Child hygiene.—Through efforts of nurses, midwives, and physicians, excellent attendance is reported at the 8 prenatal and infant welfare clinics, 7 of which are operated as branches of the main clinic in the health department building. During the year 2,028 expectant mothers were registered with the health department, and 8,173 clinic visits were made by prenatal cases. A total of 11,111 births with 503 still-births was reported, 31.9 per cent having been attended by midwives, who are supervised. The infant-welfare clinics had a registration of 4,223 babies who made 8,173 clinic visits. The 17 division nurses made 43,308 home visits in behalf of infants and preschool children. School health supervision of the 87,316 children enrolled in the 71 public schools is organized under the superintendent of schools, while the 11,000 children enrolled in 26 parochial schools are under the health officer. Children of the public and parochial schools are given a complete physical examination on admission, and periodically thereafter, and a continuous record is kept of each child in an effort to secure correction of defects found. In the parochial schools, 40 per cent of the total defects found are reported corrected by some public or private agency, while in the public schools 16 per cent are corrected by the board of education alone. Four nurses per 10,000 population are provided by the 2 departments in charge of this work. Children applying for working papers are examined at the public-school clinic.

Mental hygiene.—A psycho-educational clinic is operated by the board of education for the examination and study of pupils referred by teachers, nurses, and attendance officer. Health department clinics are maintained and follow-up work is carried on by a special nurse.

Industrial hygiene.—Industrial hygiene work by the city is performed as a part of the general sanitation activities, and covers inspection of general conditions and investigations of occupational hazards to a limited extent. A factory inspection service and rehabilitation clinic are maintained by the State.

Public health nursing.—Public health nursing is specialized. The health department furnished 34 nurses, the school board 34, and the visiting nurse association 13, giving a ratio of 18.4 nurses per 100,000 population.

Laboratory.—The usual free bacteriological service is provided, 88 diagnostic examinations per 1,000 population having been made.

Food.—There are 3,497 producing dairies, but due to lack of personnel only those producing grade A milk are inspected and scored. Herds from which grade A raw and certified milk is sold are given tuberculin tests annually. Milk is Pasteurized by the holding process in 35 plants, which are inspected six times a year, 84 per cent of the milk being thus treated. Four per cent of the supply was certified. The total consumption of 1.1 pints per capita, meets the desired standard. Food handling establishments are regularly inspected, and restaurants and bakeries are scored 4 times a year. Physical examinations are made semi-annually of employees of restaurants, ice cream and milk plants, 6,704 examinations having been made in 1923.

Sanitation.—General sanitary inspections are made as a result of complaints, in addition to routine house-to-house inspections semiannually. Records are kept by card file of all complaints, abatements, inspections, and notices served. Plumbing inspection is still under the health department.

Public utilities.—The water supply is owned by the municipality. The water is stored in eight reservoirs, and is treated by sedimentation and chlorination. The only private wells reported are those used by factories. Both separate and combined systems of sewerage are in operation, the raw sewage being discharged into the Passaic River.

Public-health education.—Health education is conducted by the health officer, aided by members of his staff. The local press, motion pictures, and exhibits are utilized, a monthly bulletin of 1,200 copies and an annual report of 600 copies are published, and special lectures are given on various health topics. A health show in June was attended by approximately 50,000 people.

Special comment.—Steady progress has evidently been made since 1920 in prenatal and infant-welfare work, and in securing increased nursing staffs for school work, as well as in public-health education. The location of specialized clinics adjacent to the headquarters of the various bureaus concerned with these problems is noteworthy. Gaseous fumigation as a means of controlling communicable diseases has been rightly abandoned in a large proportion of cities. Plumbing inspection might well be transferred to another department of municipal government as this is not generally considered a health function.

NEW BEDFORD, MASS.

New Bedford is an industrial city of 130,672 people, classified as 55.7 per cent native white, 40.2 per cent foreign born, and 4.1 per cent colored. The population per square mile was 6,636. The total taxable valuation amounted to \$1,610 per capita.

Administration.—The municipal form of government consists of a mayor, council, and board of aldermen. A paid board of health of three members is appointed by the mayor for terms of three years each, one member being a physician, in accordance with law. The agent and executive officer of the board of health is appointed under civil service for an indefinite term at a salary of \$4,000 a year on a full-time basis. The appointment and dismissal

of subordinates, fixing of salaries, making rules and regulations, and issuing of orders rest with the board of health.

Expenditures.—The expenditures of the health department in 1923 amounted to \$1.49 per capita, \$0.12 being for hospitals, \$0.61 for care of patients at the sanatorium, and \$0.04 for plumbing inspection, leaving \$0.72 for health purposes proper. This compares with an expenditure of \$1.16 in 1920, \$0.54 having been for health purposes.

Vital statistics.—Registration of vital statistics is conducted by the city clerk. Death certificates are received by the health department and delivered to the city clerk after the burial permit is issued. An annual canvass of births is made in January to ascertain completeness of reporting. Approximately 99 per cent of the births and 100 per cent of the deaths are reported.

Communicable-disease control.—There was an average of 5 cases of typhoid, 12.7 cases of diphtheria, 26 cases of scarlet fever, 451 cases of measles, and 95 cases of whooping cough reported for each annual death from these diseases. Eighty per cent of the cases of typhoid, 10 per cent of the cases of diphtheria and scarlet fever, and 100 per cent of the cases of smallpox are hospitalized. There are 80 hospital beds available per 100,000 population for communicable-disease cases. It is reported that 75 per cent of the children of the public schools (95 per cent of all children of the first grades) and 60 per cent of the children of the parochial schools have been vaccinated against smallpox. A total of 3,500 children have been immunized against diphtheria by the use of toxin-antitoxin mixtures.

Tuberculosis.—There were 334 cases of tuberculosis, with 120 deaths reported. One clinic is maintained by the health department for diagnostic and treatment purposes. A total of 1,281 clinic patients (106 new patients) paid 4,880 visits during the year. Nurses' visits in behalf of tuberculosis cases numbered 8,557. There were 165 admissions to hospitals during the year from the city.

Venereal diseases.—Reports were received of 57 cases of syphilis and 54 cases of gonorrhea, while 6,979 visits were made to the venereal-disease clinic operated by the health department. Provision is made for the follow up of venereal-disease cases in the homes.

Child hygiene.—Of the 3,480 live births, 13 per cent were attended by midwives, although their practice is not supervised in the State because the practice of midwifery is illegal. There were 795 deliveries in hospitals. Although there are no prenatal clinics, infant-welfare nurses visit expectant mothers in the home. There are 7 health department infant-welfare nurses. A total of 1,082 children under 2 years of age paid 7,823 visits to clinics, while 47,000 visits were made to homes by nurses and 110 visits by physicians. Health supervision of children of the public schools is carried on by the board of education, and the health department supervises the health of children of the parochial schools. A physical examination is required of children applying for working papers, as called for in the statutes.

Industrial hygiene.—This work is limited to activities of individual concerns and to the State department of labor.

Public-health nursing.—Seventeen nurses were employed by the health department and six by the board of education, giving a ratio of 17.5²⁸ nurses per 100,000 population.

Laboratory.—A total of 9,793 examinations was made in the health department laboratory, 9,000 of these having been made of rats in connection with antiplague measures.

²⁸ Exclusive of public-health nurses employed by private agencies, approximately 14.

Food and sanitation.—Limited supervision is exercised over the milk supply by inspectors of the health department. Tuberculin testing of herds is required of those from which certified milk is sold. Approximately 70 per cent of the milk supply was Pasteurized. The per capita milk consumption amounted to 0.9 pint daily. Food-handling establishments are regularly inspected. The department employs four sanitary and two plumbing inspectors for routine work. The disposal of garbage is carried on by the health department, the reduction method having been employed until recently, when the plant was destroyed. A special rat survey has been carried on during the year.

Public utilities.—The public water supply, owned by the city, is derived from protected ponds, the only treatment being by storage. All of the people were served by the public supply. Laboratory supervision is exercised by the State department of public health. The sewerage system, chiefly of the combined type, was accessible for 99 per cent of the population, the sewage being discharged untreated into the harbor. There were 180 privy vaults still in use in outlying districts.

Public-health education.—The executive officer publishes an annual report of 350 copies, prepares weekly articles for the press, and delivers occasional lectures on infant welfare and personal hygiene.

Special comment.—Progress has been made since 1920 in extending the child-hygiene program, but this campaign should be continued to reach to children of preschool age. It would seem desirable that medical examinations of school children should be carried on under one city department and should be sufficiently complete to include examinations of heart and lungs at least three times during the school career, together with a systematic effort for the correction of physical defects found. Pasteurization of all milk not from tuberculin-tested herds should be required, and greater utilization should be made of the laboratory.

NEW HAVEN, CONN.

The population of New Haven was 172,967, classified as 69.1 per cent native white, 28.1 per cent foreign born, and 2.8 per cent colored. An area of 17.4 square miles is occupied, giving a population per square mile of 9,941. The taxable valuation was \$1,488 per capita.

Administration.—A mayor and board of aldermen govern the city. A board of health commissioners of six members is appointed for a term of five years by the mayor for the general control of all health affairs, through an executive health officer appointed by the board, for the appointment of subordinate members of the department, and for the making of rules and regulations. The office of health officer is under civil service. He receives a salary of \$5,000 as a full-time official.

Expenditures.—The total expenditures of the department in 1923 amounted to \$0.56 per capita, the entire amount being devoted to health purposes. The per capita expenditure in 1920 was \$0.45.

Vital statistics.—Registration of vital statistics is conducted by the registrar of vital statistics, and checks for completeness and accuracy are made of certificates of births and deaths, with satisfactory results. Reports of births and of principal causes of deaths are made regularly to the health department, and summaries are published monthly in the health bulletin.

Communicable-disease control.—Measures for the control of communicable diseases are in accord with the standards of the American Public Health Association. Reporting of the principal communicable diseases is better than the

average and vaccination of school children against smallpox is enforced, over 90 per cent having been vaccinated. Hospital facilities are adequate for present needs, there being 78 beds for the common communicable diseases and 30 beds for smallpox cases. An excellent program for control of diphtheria has been developed, and 828 children of preschool and school age have been immunized, while 1,486 others have given negative reactions to the Schick test.

Tuberculosis.—A total of 313 cases with 138 deaths was reported. Two clinics are maintained, one by the health department and one by the New Haven Hospital Dispensary. A total of 1,078 patients was registered at these clinics, while 17,604 nursing visits in behalf of tuberculous cases were made by nurses of the health department and of the visiting nurse association. There were 128 patients admitted to country and State sanatoria during the year.

Venereal diseases.—Reporting in accordance with State law is by office number to the local health department, and 225 cases of syphilis and 106 cases of gonorrhea were reported. Two clinics are maintained, one at the New Haven Hospital Dispensary and one by the health department, where over 7,176 visits were made for diagnosis and treatment. A systematic follow-up of patients is made by nurses of the New Haven Dispensary. Acute cases are hospitalized, when necessary, in the New Haven Hospital.

Child hygiene.—A bureau of child hygiene in the health department devotes its major attention to school work, although two nurses of the nursing bureau carry on prenatal, infant, and preschool work, also midwife supervision, and efforts are made to secure immunization of children of these age groups against diphtheria. The New Haven Dispensary includes a complete prenatal and obstetrical service in connection with a women's clinic, while the visiting nurse association provides prenatal and infant welfare nursing service, holds a weekly prenatal clinic, and 15 infant-welfare clinics. Of the 3,947 live births, 22 per cent were attended by midwives who are supervised by the health department, while 30 per cent occurred in hospitals. In all, 1,320 expectant mothers received prenatal care, while 9,923 children of preschool age were registered at clinics as having made 18,395 visits during the year. A total of 80,931 home visits to children of preschool age was made by nurses. All children of the first four grades of the public and parochial schools receive a complete physical examination every two years. Children having defective teeth who can not afford treatment by a private dentist are cared for in the dental clinic. Children applying for working papers must be physically examined by a physician appointed by the board of education.

Mental hygiene.—Although no mental hygiene work is done by the health department, an excellent psychological clinic is conducted by the department of education and is accessible to and used by the city and private welfare agencies. A psychiatric clinic is maintained by the Connecticut Society for Mental Hygiene.

Industrial hygiene.—Work in this field is confined to the private activities of industrial concerns.

Public-health nursing.—A nursing bureau in the health department provided 24 nurses doing specialized work, while 50 nurses of the visiting nurse association are organized to do generalized nursing, consisting of bedside nursing, prenatal and infant welfare nursing, and tuberculosis nursing. This gives a ratio of 42.8 nurses per 100,000 population, in addition to nurses on the staff of the Yale School of Nursing, who cooperate with those of the local organizations.

Laboratory.—The usual free bacteriological and chemical service is provided for the community. Wassermann tests are made in the State laboratory and

the New Haven Hospital laboratory. A total of 52 diagnostic examinations per 1,000 population was made in the public-health laboratory in 1923.

Food.—Systematic supervision over the milk supply is exercised from the source to the point of delivery. Ninety per cent of the milk supply was Pasteurized, the remainder coming from tuberculin-tested herds. The per capita milk consumption amounted to 0.92 pint per person daily. All food-handling establishments are regularly inspected and scored, and licenses are issued to restaurants, slaughterhouses, poultry houses, and rendering plants.

Sanitation.—General sanitary inspections are made upon the initiative of the department as well as in the follow-up of complaints for the abatement of nuisances. Special measures are directed against fly and mosquito breeding.

Public utilities.—The public water supply, privately owned, served all the people. The water, derived from five supplies, is chlorinated. In addition, the water from one of the supplies serving one-third of the population is also passed through slow sand filters before chlorination. The combined system of sewerage is largely employed and accommodated approximately 90 per cent of the population, the sewage being discharged untreated into the harbor.

Public-health education.—The health officer utilizes the daily press, and moving pictures and lectures are frequently given by heads of the bureaus to the various civic organizations. An annual report and a monthly bulletin are published.

Special comment.—Progress has been made since 1920 in the control of diphtheria through the use of the Schick test and immunization measures and in the development of public-health education. There is need for a coordinated program of antituberculosis work for increased school health activities to provide a complete physical examination three times during school life.

NEW ORLEANS, LA.

The population of New Orleans was 404,575, classified as 67.2 per cent native white, 6.7 per cent foreign born, and 26.1 per cent colored. An area of 196.3 square miles is occupied, giving a population per square mile of 2,061. The taxable valuation was \$1,096 per capita.

Administration.—The city is governed by a commission. There is a board of health of five members appointed by the commissioners for a term of four years to serve in an advisory capacity to the superintendent of health and to recommend ordinances to the commission council for adoption. The superintendent of health and chairman of the board of health is appointed by the council on a part-time basis for a term of four years at a salary of \$5,000. He has broad administrative powers necessary for the conduct of city health work.

Expenditure.—The per capita expenditure by the health department in 1923 amounted to \$0.54, of which \$0.05 was for hospitals, and \$0.05 for rat control. The department of education expends 5.9 cents per capita for school health supervision. In 1920 the expenditure of the department of health amounted to \$0.46 per capita, of which \$0.36 was for health purposes proper.

Vital statistics.—The registration of vital statistics is conducted by the health department, and certificates of births and deaths are regularly checked for completeness and accuracy. The city is not yet in the birth-registration area. Classified tabulations are made and reports are published in the monthly bulletin.

Communicable-disease control.—There is an average of 4.6 cases of typhoid fever, 21.6 cases of diphtheria, 47.5 cases of scarlet fever, 12.5 cases of measles, and 6 cases of whooping cough for each annual death from these diseases.

These figures suggest that reporting of typhoid, measles, and whooping cough is only partially complete, for minimum standards of completeness call for reporting of at least 10 cases of typhoid, 15 cases of diphtheria, 50 cases of scarlet fever, 100 cases of measles, and 25 cases of whooping cough for each death. There are 66 hospital beds for communicable diseases per 100,000 population, and smallpox and typhoid cases are evidently well cared for by this means, while 10 per cent of the cases of diphtheria and 5 per cent of the cases of scarlet fever are hospitalized.

Tuberculosis.—There were 1,011 cases with 693 deaths reported. A night clinic is maintained by the health department and day clinics are operated by voluntary agencies. There were 483 patients registered at clinics of voluntary agencies, while 2,680 clinic visits were made during the year. A total of 4,160 visits was made by nurses in behalf of tuberculosis cases. At the charity hospital 90 beds are available for city cases, 495 patients being admitted.

Venereal diseases.—Reporting of cases is by office number to the health department, 2,350 cases of syphilis, 1,808 cases of gonorrhea, and 354 other cases having been reported. Clinic facilities are provided by the health department, by the charity hospital, and at the Touro Infirmary, where 4,146 patients made an average of eight visits per case for treatment.

Child hygiene.—Of 10,268 live births, 44 per cent were attended by midwives, who are registered and supervised by the health department. Prenatal clinic and home-visitation service is provided by the nurses of the child-welfare association, while 18 infant-welfare clinics are maintained by this organization and two clinics by local hospitals. A total of 7,382 infants and preschool children are registered as under care, 35,247 visits to clinic having been made, while 2,935 visits to homes were made by physicians and 8,444 visits by nurses. School health supervision is carried on by the board of education, the work in private and parochial schools being limited to the occasional employment of private physicians. Children of the public schools from the kindergarten through the fourth grades are physically examined on admission and yearly thereafter in special cases. Statistics of defects found and corrected are not compiled. No physical examination is required of children applying for working papers. No special activities are carried on for the promotion of mental health.

Industrial hygiene.—There are no official activities in industrial hygiene.

Public-health nursing.—Nursing work in the health department is organized as a subdivision of the communicable-disease division, with 10 nurses, while 8 nurses were supplied by the board of education, 31 by the child welfare association, and 8 by the visiting nurse association. This gives a ratio of 14.1 nurses per 100,000 population.

Laboratory.—The usual free public-health laboratory service is provided, 101 diagnostic examinations per 1,000 population having been made.

Food.—Dairies producing milk for the city are inspected four times a year and scored. All cows must be tuberculin tested. Sixty per cent of the milk supply was Pasteurized. The per capita milk consumption was only half what it should be, averaging 0.5 pint daily. Inspections are regularly made of meat markets, bakeries, grocery stores, restaurants, ice-cream stands, and other food establishments, and the majority of these places are scored.

Sanitation.—This work is organized as a division of sanitation and rat eradication. Inspections are made both as a routine measure and as a result of citizens' complaints for the abatement of nuisances. Closed receptacles are required for stable manure, with removal twice a week. There is considerable work done for the prevention of mosquito and rat breeding, full responsibility for these activities having been assumed by the city health department.

Public utilities.—The public water supply owned by the city is derived from the Mississippi River, and is treated by sedimentation, filtration, and chlorination before being served to 95 per cent of the population. Laboratory analyses of the treated water showed *B. coli* present in one-half of 1 per cent of the 10-cubic centimeter treated samples. The separate type of sewerage system was utilized by 92 per cent of the population, the sewage being discharged untreated into the Mississippi River.

Public-health education.—The superintendent of health publishes an annual report of 2,000 copies as well as a monthly bulletin. The daily press is utilized, as are special exhibits. An average of 50 lectures on various health subjects is given during the year to midwives, to schools, and to various civic bodies.

Special comment.—Progress has been made since 1920 in securing an increased number of nurses for communicable-disease work, and the extension of the program for control of tuberculosis and venereal diseases. There are still needed increased appropriations to allow for the expansion of the maternity and child-hygiene work, and for regular supervision of children of the parochial schools. A more active campaign of public-health education should be made possible.

NEW YORK, N. Y.

The population of New York City was estimated in 1923 to be 5,927,625, with a broad classification of the population according to nativity, as follows: Native white, 63 per cent; foreign born, 35 per cent; colored, 2 per cent. The city occupies an area of 316 square miles. The total taxable valuation on a 100 per cent basis was indicated as \$1,866 per capita.

Administration.—The city is governed by a mayor, a board of aldermen, and five borough presidents. The board of health consists of the health commissioner, the police commissioner, appointed by the mayor, and the health officer of the port, appointed by the governor. It has legislative functions, judicial functions, and policy forming functions of a broad character. There is a medical advisory board, appointed by the board of health, and an advisory council of 19 members, including laymen as well as physicians, appointed by the mayor for a term of office, the same as that of the mayor, on a full-time basis at \$7,500 a year (1924, \$10,000). Although it is required by law that the commissioner be a physician of 10 years' experience in the practice of medicine and a citizen of New York, he is not required to have had experience or training in public-health administration or preventive medicine.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.88 per capita, \$0.30 being for hospitals, \$0.01 for mosquito control, and \$0.57 for health purposes proper. In 1920 the per capita expenditure of the department of health was \$1.02, of which \$0.69 was for health purposes proper and \$0.33 for hospital service for the care of communicable diseases.

Vital statistics.—A bureau of vital statistics in the health department handles all records of births, deaths, and marriages, and enforces regulations dealing with their notification. Completeness of reports is maintained by occasional checks and by education of the physicians and midwives. Recording of births, deaths, and sickness by district sanitary units has been instituted. Supervision is maintained of the registration of physicians in the city and internes in public institutions. Searches are made of the various records to the extent of almost a quarter of a million yearly, and certified copies of the records are issued to the extent of 175,000 annually. Standard statistical tables are prepared weekly, monthly, and yearly, and many other tabulations are prepared upon request.

Communicable-disease control.—Excellent regulations exist for the notification, isolation, and release of cases of communicable diseases, and control measures conform to accepted standards. There were 29 communicable-disease hospital beds per 100,000 population. All school children have been vaccinated against smallpox. A large proportion of the school children have been Schick tested and protected by immunization measures against diphtheria through the pioneer activities of the staff of the bureau of laboratories in close association with other bureaus of the health department.

Tuberculosis.—A total of 11,336 cases of pulmonary tuberculosis, with 4,951 deaths, was reported. The number of visits of nurses in behalf of tuberculosis cases was 183,654. Clinic and hospital facilities are provided by the health department and the New York tuberculosis association, and active follow-up work is provided by these and similar agencies.

Venereal diseases.—Reporting in accordance with State and municipal regulations is by sealed card, and also through the laboratory conducted by the health department. A total of 16,852 cases of syphilis and 6,863 cases of gonorrhea was reported. Although services for the diagnosis, isolation, treatment, and control of venereal diseases by the health department are less extensive than those provided for other communicable diseases, morning and night treatment clinics are conducted. A limited number of hospital beds is available for venereal disease cases. Laboratory facilities are used to an increasing extent, but follow-up work through clinics is of a limited character.

Child hygiene.—Through its organized bureau of child hygiene, which was the first of its kind in this country, New York City has developed a sound policy of health protection of maternity, infancy, and childhood through school life. A system of prenatal clinics and baby-welfare stations covers the city and is supplemented by an excellent nursing service. Midwives, who attended 26 per cent of births during the year, are supervised by the department of health. The health department cooperates with the maternity association, the Henry Street settlement, the association for improving the conditions of the poor, and various hospitals and other institutions in the follow-up of reported cases of expectant mothers. A total of 37,159 children under 2 years of age was registered at the 70 health-department clinics as having paid 739,936 visits to clinics, while visits of physicians and nurses to homes numbered 206,238. Clinics for children of preschool age are conducted in connection with hospitals and settlement houses and by various organizations, and coordination of activities is secured through the children's welfare federation. School health supervision is a function of the health department, and complete physical examinations are given children of the first, third, and sixth grades as well as to special cases. A total of 294,754 children was examined during the year, and 203,184 defects were discovered. Children whose defects were corrected sufficiently to lead to actual aftertreatment numbered 70,795. In addition to the work enumerated as performed under the bureau of child hygiene, there are a number of dental and eye clinics in public schools conducted under the supervision of this bureau, which care for the eyes and teeth of children. The eye clinics not only make routine examinations and treat contagious diseases of the eye, but also examine candidates for sight conservation classes conducted in the schools and advise teachers thereof as to the proper care and treatment of the pupils. Children applying for working papers are required first to pass a physical examination. There are several clinics and other activities for the care and promotion of mental health organized by private agencies.

Industrial hygiene.—New York has an occupational-disease clinic and facilities for the supervision of sanitation and health of workers in industries. All

diseases of occupations are reported to the health department and records are maintained on file. A survey of factories was made during the year.

Public-health nursing.—Supervision of public-health nursing is centralized. The health department employed 540 nurses. Public-health nursing by unofficial agencies in New York is developed to a considerable degree of effectiveness.²⁹ There is need for an increase in the nursing staff of the health department.

Laboratory.—New York City was the first to provide free diagnostic service for physicians suspecting cases of communicable diseases. A total of 44 diagnostic examinations per 1,000 population was made during the year, in addition to a large number of bacterial and chemical examinations of milk and water. Extensive research work, for which the New York City laboratory has long been noted, was carried on. The beneficial effects of the research and diagnostic work done by the bureau of laboratories in New York City is difficult to overestimate.

Food.—There were 48,750 producing dairies which were inspected at intervals. Tuberculin testing of all cattle producing milk to be sold raw is required. There were 32 dairies producing milk of a certified grade under the supervision of the New York and Kings County medical societies. Over 98 per cent of the milk supply was Pasteurized. The per capita milk consumption amounted to approximately 1 pint per day. Supervision is exercised over all food establishments in the city, and it is required that a physical examination be made of food handlers once a year, either by a physician of the health department or by a private physician.

Sanitation.—The sanitary bureau has charge of the abatement of nuisances, of the preservation of wholesomeness of air in all classes of buildings except tenement houses, of the protection of the purity of water supply, of the prevention of the breeding of flies and mosquitoes, and of the supervision of the various trades and industries. House-to-house inspections throughout the various boroughs are made in an effort to correct insanitary conditions as well as in the follow-up of citizens' complaints. Antimosquito measures are under the supervision of the sanitary engineers. Active measures are also directed against rats through surveys and laboratory examination.

Public utilities.—The public water supply, owned by the city, is treated by sedimentation in lakes or reservoirs, by aeration, and by chlorination. Laboratory analysis of the treated water showed *B. coli* absent in 1-cubic-centimeter samples. There were reported to be about 500 wells in use in outlying districts under the supervision of the health department, in addition to 400 individual supplies. Both combined and separate systems of sewerage are employed under the control of various sewage bureaus. A portion of the sewage is treated by screening and sedimentation before discharge of the effluent into the harbor.

Public-health education.—Public-health education is conducted by a medical director. An annual report of 1,000 copies, a monthly bulletin of 5,000 copies, a weekly bulletin of 11,000 copies, and other special bulletins are published. The daily press is utilized, and frequent lectures on health topics are given by the health-department staff. Exhibits illustrating public-health procedures and results have been prepared.

Special comment.—As in 1920, it may be well to point out that, while the health administration of the city of New York offers much to praise, the scheme and theory of service fail of the best results from the lack of a sufficiently large trained personnel. Not less than one physician for every 4,500 school children and one nurse for every 2,000 school children are needed in order that

²⁹ Approximately 420 nurses were employed by private agencies.

adequate supervision of school children may be exercised. Activities in health education may well be extended.

NORFOLK, VA.

Norfolk is a city of 159,089 people, of whom 64 per cent are white and 36 per cent colored. The population per square mile was 4,419. The total taxable valuation amounted to \$1,288 per capita.

Administration.—There is a council of five members and a city manager. The health officer is appointed by the city manager on a full-time basis at a salary of \$7,500 a year, to serve for an indefinite term. He has broad administrative powers.

Expenditures.—The health department expenditures in 1923 amounted to \$0.85 per capita, of which \$0.06 was for hospitals and \$0.31 for medical relief of the poor. In 1920, \$0.79 per capita was expended, \$0.65 being for health purposes and \$0.11 for hospital services, with \$0.03 for miscellaneous purposes. During that year the salary of the health officer was \$6,000.

Vital statistics.—The collection and analysis of vital statistics is a function of the health department, and a special bureau is maintained for this purpose. Reports are issued monthly to public-health officials and physicians. It is presumed that 90 per cent of the births and 100 per cent of the deaths are reported. Death certificates from communicable diseases are routinely checked against disease reports, and deaths under one year and stillbirths are checked against reported births and stillbirths.

Communicable-disease control.—Measures for the control of communicable diseases are in accord with the standards of the American Public Health Association, and reporting is reasonably complete. All of the school children are reported to have been vaccinated against smallpox and about 5,000 people have been immunized against diphtheria. There are 80 hospital beds for communicable-disease patients per 100,000 population.

Tuberculosis.—A total of 308 cases with 173 deaths was reported. Clinic service is provided by the health department. In 1924 there were 191 new patients in attendance at clinic, while 2,837 visits by nurses were made in behalf of tuberculous cases. Provision is made for hospitalization of tuberculous cases by contract with a private hospital.

Venereal diseases.—Reports of venereal diseases are not available, although 2,230 patients were registered at the municipal venereal-disease clinic as having made 4,802 visits, and received 4,177 treatments for syphilis and 888 treatments for gonorrhea.

Child hygiene.—While there are no prenatal clinics, instruction is given expectant mothers by physicians and nurses employed by the King's Daughters' organization, and at five health centers, including a health center for colored persons. The activities of the King's Daughters are closely associated with that of the health department, which appropriates \$6,000 for the work, while the health officer is a member of the board of directors. A total of 29,968 nurses' visits was made in behalf of children under 2 years of age during the year, while 10,588 visits were made to infant-welfare clinics maintained by the health department and the King's Daughters. Health supervision of children of the public schools is carried on by a staff of the health department consisting of a chief medical inspector, seven part-time physicians, and 12 nurses. A complete physical examination is given children of all grades at the beginning of each school year, a total of 16,352 examinations having been made. There were 6,369 defects discovered, and 5,601 defects corrected during the year. It is required that children applying for working papers shall pass a

physical examination given by the school health supervision staff. There are no organized activities for the promotion of mental health.

Industrial hygiene.—Inspections of a sanitary character are made of industrial plants by the health-department inspectors, and special industrial-hygiene lectures are given to groups of workmen.

Public-health nursing.—Nineteen nurses were employed by the health department and 16 by voluntary agencies working in direct cooperation with the department of health. These agencies receive an appropriation from the health department and are under the supervision of the health commissioner. This gives a ratio of 22 nurses per 100,000 population.

Laboratory.—A public-health laboratory is maintained, where 69 diagnostic analyses per 1,000 population were made during the year, in addition to a total of 1,912 bacteriological and chemical analyses of water and milk.

Food and sanitation.—A total of 1,317 inspections was made by the bureau of milk and dairy inspection during the year. It is required that all herds be tuberculin tested once a year. There are three milk plants, in which 60 per cent of the milk supplied was Pasteurized. The per capita milk consumption amounted to only 0.4 pint daily, which is less than half the minimum standard suggested as desirable by nutrition experts. All places where foods are sold are licensed and regularly inspected. Restaurants, bakeries, soda fountains, and ice-cream and bottling plants are scored every two months. A physical examination is required made of food handlers twice a year. A total of 64,613 general sanitary inspections was made during the year chiefly for the abatement of nuisances. The disposal of garbage and refuse is a function of the department of public works with supervision exercised by the health department. The method of disposal is by incineration, and no garbage is permitted in the public dumps. Legal provisions for the prevention of fly breeding require that bins for stable manure be waterproof and fly-proof. The measures for the prevention of mosquitoes include ditching and oiling of breeding places.

Public utilities.—The water supply, owned by the city, is derived from lakes and the water is treated by sedimentation, filtration, and chlorination before being served to all of the people. The separate type of sewerage is employed and accommodated 95 per cent of the population, the sewage being discharged untreated into the Elizabeth River.

Public-health education.—The commissioner of health publishes a monthly bulletin of 800 copies and frequently utilizes the press. Members of the staff of the health department deliver an average of 50 lectures during the year before civic groups on topics relating to health. Exhibits have been prepared illustrating communicable-disease and infant-hygiene problems.

Special comment.—Progress has been made since 1920 in securing increased facilities for the hospitalization of communicable diseases. There are still needed increased beds for tuberculosis cases. The program for the protection of maternity and infancy should be extended, and increased milk consumption should be stimulated. The importance of Pasteurization of milk should be emphasized in order that protection by this means may be insured to a greater degree than at present.³⁰

OAKLAND, CALIF.

Oakland is a city of 240,086 people, of whom 79.2 per cent are native white, 18.7 per cent foreign born, and 2.1 per cent colored. The city occupies an area of 58 square miles, giving a population per square mile of 4,300. The taxable valuation amounted to \$1,412 per capita.

³⁰ In 1925, 70 per cent of the supply is Pasteurized.

Administration.—A commission form of organization exists, with a mayor and four commissioners. There is no board of health, but an advisory council serves upon request. The health department operates under a commissioner of public health and safety, who appoints the part-time health officer at a salary of \$3,000 for a term determined by the commissioners. The health officer must be a graduate in medicine, licensed in the State, who has practiced five years.

Expenditures.—The per capita expenditure of the health department in 1923 amounted to \$0.50 (69 per cent for salaries), including \$0.04 for plumbing inspection. This compares with \$0.51 spent for health purposes in 1920.

Vital statistics.—Registration is performed by the director of the bureau of records and education. The International List of Causes of Death is used and the standard classifications are made for both births and deaths.

Communicable-disease control.—Reports of only 3.4 cases of typhoid and of 17 cases of whooping cough for each death from these causes are low, but it should be pointed out that many of the deaths due to typhoid were among cases brought from outside the city for hospitalization only. For scarlet fever (132 cases per death) and for measles (138 cases per death) the reporting situation is creditable. Case records of diseases are filed chronologically by disease, and spot maps and charts of the common diseases are utilized. The department maintains a consulting diagnostic service for use by physicians, and follows standard procedure in regard to isolation and release of patients, including the requirement for negative cultures before the release of typhoid patients. A county hospital with 35 beds is available for communicable-disease patients. No general vaccination has been attempted in 10 years, and only 46 per cent of the school children have been vaccinated. No Schick testing or diphtheria immunization work has been attempted.

Tuberculosis.—A total of 141 cases was reported with 140 deaths, an indication of lax reporting. A county hospital is available for advanced cases, and a sanatorium for incipient and moderately advanced cases, 75 adults having been admitted to the former and 135 adults and 40 children to the latter during the year. Clinic service is provided at the Alameda County public health center. During 1923 the tuberculosis work was carried on by two health-department nurses under the direction of the Alameda County health center. Since February, 1924, the work has been carried on under the direction of the health department by generalized public-health nurses, supervised by a nurse from the State tuberculosis association.

Venereal disease.—Reports by number of 36 cases of syphilis and 93 cases of gonorrhea, according to State law, were received in 1923. At the county health center clinic, maintained for diagnosis and treatment, 175 cases were treated for syphilis and 969 for gonorrhea.

Child hygiene.—Relatively little child-hygiene work is done by the health department, most of the infant-welfare work being performed by private and voluntary agencies. A prenatal clinic is maintained at the babies' hospital, where 330 expectant mothers were registered during the year. Of 4,029 births registered in 1922, 10 per cent were delivered by midwives registered by the State, but otherwise not supervised. There are 11 infant-welfare and preschool clinics conducted jointly by the Alameda public-health consultation center and the baby hospital association. A medical, dental, and nursing staff is maintained by the board of education to carry out a broad program of school health supervision, which includes a physical examination twice a year of children of the first, fifth or sixth, and ninth grades. This includes heart

and lungs. A total of 16,651 examinations was made, and 15,522 defects were corrected.

Public-health nursing.—Health department nurses are assigned to districts where they perform the various nursing functions which come under the jurisdiction of the department. During 1923, 36 nurses were employed—12 by the school board, 9 by the visiting-nurse association, 6 by the baby-hospital association, and 9 by the health department, giving a ratio of 15 nurses per 100,000 population.

Laboratory.—The usual free bacteriological and chemical service is provided for the community, 81 diagnostic specimens per 1,000 population having been examined. Specimens of blood for Wassermann examinations are sent to the State laboratory.

Food and sanitation.—Milk is obtained from 126 dairies, which are inspected and scored every three months by the department inspector. Cows from which milk of certified grade and Grade A raw is sold are tuberculin tested, and 85 per cent of the supply was Pasteurized in plants receiving weekly inspection. Three per cent of the supply was of certified grade. The per capita consumption of 0.9 pint is still below the desired standard of 1 pint per person per day. All the important food establishments are inspected and meat markets are scored. Steam sterilization of eating utensils is required. Paper cups are required at soda fountains. General sanitary inspection includes the usual procedures for nuisance prevention, the conditions in occupied dwellings, etc. Fly-tight boxes are required for stable manure. There is no mosquito problem. Rat-extermination measures include rat-proofing of new buildings and trapping in infested areas.

Public utilities.—The water supply, privately owned and operated, is obtained from driven wells and from watersheds. Treatment consists of rapid sand filtration and chlorination. Approximately 97 per cent of the population was served. As shown by survey, 1,600 private wells were still in use. Both separate and combined sewerage systems are used, the raw sewage being discharged into the bay. About 800 privy vaults were in use, supervised by the health-department inspectors.

Public-health education.—Except for the utilization of the daily press and for several lectures during the year on general health topics there is no public-health education work carried on by the health department.

Special comment.—The creation of a nursing bureau on the generalized plan is a step in the right direction. As in 1920, it should be indicated that a sufficient salary should be granted the health officer to provide for full-time service. Approximately one bed per 2,000 is needed for hospitalization of communicable diseases³¹ in addition to need for increased nursing service. Infant-hygiene activities should be expanded by the health department, as should public-health education.

OKLAHOMA CITY, OKLA.

Oklahoma City is a city of 101,150 population, classified as 89.2 per cent native white, 3.8 per cent foreign born, and 7 per cent colored. The city occupies an area of 17.9 square miles, giving a population of 5,651 people per square mile. The taxable valuation amounted to \$1,108 per capita.

Administration.—The city is governed by a commission of five members, the commissioner of public safety, the commissioner of health, and the secretary of the health department serving as a board of health. The commissioner of

³¹ A new county hospital is in the course of construction (1925), which will provide for the necessary hospitalization facilities.

health is appointed by the commissioner of public safety on a part-time basis, at a salary of \$3,600 per year for a term of four years. He is not under civil service, qualifications for the office specifying only that he must have practiced medicine three years. His removal rests with the city commissioners.

Expenditures.—The per capita expenditures of the health department in 1923 amounted to \$1.18, but of this \$0.11 was for hospitals and \$0.66 for garbage collection and disposal, leaving \$0.41 for health purposes, as compared with \$0.41 per capita in 1920.

Vital statistics.—Registration of vital statistics is conducted by the secretary of the health department. The International List of Causes of Death is used, and certificates of births and deaths are checked.

Communicable-disease control.—Reporting of typhoid and diphtheria cases is apparently incomplete, as the total cases of typhoid per death number but 3.9 and of diphtheria 10.4, as compared with standards of 10 and 15, respectively. A creditable record is shown, however, for scarlet fever, measles, and whooping cough. Gaseous fumigation is still practiced. Beds set aside for smallpox and scarlet-fever cases number 48.8 per 100,000 population, but no provision is made for hospitalization of cases of diphtheria and typhoid fever.

Tuberculosis.—There were 44 cases with 58 resident deaths reported, indicating incompleteness of reporting of this disease. The city health department has no organized antituberculosis program, although a tuberculosis clinic is operated twice a week by private agencies, and 92 beds are available in city, county, and private institutions, where 249 cases were hospitalized during the year. Nursing visits to tuberculosis cases numbered 5,662.

Venereal diseases.—Reporting is by name and address and by office number to the State department, 18 cases of syphilis and 44 cases of gonorrhea having been reported. A State and city clinic is operated where 233 cases of syphilis and 98 cases of gonorrhea received treatment. One social-service worker is employed.

Child hygiene.—One prenatal clinic is maintained by the University Medical School, where 198 expectant mothers were registered. Midwives are not licensed nor supervised. Five infant-welfare clinics are operated by the nursing bureau of the department of public affairs, 733 children under 2 years of age having made 1,527 clinic visits, while 8,453 nurses' visits were made to children of this age group. A division of school hygiene is maintained by the board of education, with a full-time physician, a part-time physician, and five school nurses from the nursing bureau provided for the 25,728 children enrolled in public schools. No special provision is made for parochial-school children. Effort is made to give a complete physical examination annually to children of the first seven grades, 15,091 examinations having been made, but data as to corrections of the 17,762 defects found are not complete. Physical examination of children applying for working papers is made when the issuing officer so requests.

Public-health nursing.—A bureau of public-health nursing with central supervision is organized in the department of public affairs, 11 nurses being provided. One nurse was employed by the health department, and 5 nurses were employed by the board of education, giving a total of 16.8 nurses per 100,000 population.

Laboratory.—There were 690 water examinations and 609 milk examinations, with a total of 1,344 other examinations, chiefly of a diagnostic character.

Food.—Dairies are inspected and scored monthly, tuberculin testing of herds from which raw milk is sold is required, and 55 per cent of the supply was Pasteurized. The per capita consumption was 0.7 pint per day. Supervision is exercised over places where food is prepared or sold, 3,697 inspections having

been made. Physical examination of food handlers is required made once a year.

Sanitation.—Sanitary inspections are made for the abatement of nuisances, and regulations exist for the prevention of fly breeding by removal of stable manure twice weekly.

Public utilities.—The city water from the Canadian River and an artificial lake is chlorinated before being supplied to all the people of the city. There were 200 private wells also in use. The separate system of sewerage is employed, and served 85 per cent of the population. At present there is no treatment of the sewage, but plans are ready for treatment by Imhoff tanks and trickling filters. There were 750 privy vaults in use in unsewered districts.

Public-health education.—There is no concerted effort to educate the public in principles of healthy living.

Special comment.—Progress has been made in providing for more complete health supervision of children of the parochial schools, for safeguarding the water supply, and for treating the sewage. Efforts should be made to secure better reporting of diphtheria, typhoid, tuberculosis, and the venereal diseases, and increased hospitalization of cases. Gaseous fumigation should be abandoned. The health appropriation should be materially increased to permit increased personnel for child hygiene and nursing work. The need for a campaign of public-health education is indicated.

OMAHA, NEBR.

The population of Omaha was 204,382, classified as 77 per cent native white, 17.8 per cent foreign born, and 5.2 per cent colored. This is a residential city with an estimated population per square mile of 5,400 people.

Administration.—The city is governed by a commission. There is no advisory council nor board of health. The health commissioner is appointed by the mayor with confirmation by council, and his salary on a part-time basis is \$3,600 a year. The term of office is for an indefinite period. Broad administrative powers are given the commissioner.

Expenditures.—Expenditures by the health department in 1923 amounted to \$0.79 per capita, including (in 1922) \$0.08 for hospitals, \$0.41 for garbage disposal, \$0.01 for plumbing inspection, and \$0.01 for housing inspection. In 1920 the expenditures of the health department amounted to \$0.66 per capita, of which \$0.27 were spent for health purposes proper, \$0.16 for hospitals, and \$0.24 for garbage and refuse removal.

Vital statistics.—Registration of vital statistics is conducted in the city health department. The International List of the Causes of Death is used and certificates are checked for completeness and accuracy. Annual reports are issued containing tables with data classified according to nativity, sex, age, and cause.

Communicable-disease control.—The fact that only 3.8 cases of typhoid and 11 cases of diphtheria are reported for each annual death is an indication of incompleteness of reporting of these diseases, but reports of scarlet fever, measles, and whooping cough are apparently more satisfactory. Twenty-five per cent of the cases of typhoid, diphtheria, and scarlet fever, and 50 per cent of the cases of smallpox are hospitalized. Gaseous fumigation is still practiced as a means for communicable-disease control. From 50 to 75 per cent of the school children have been vaccinated against smallpox.

Tuberculosis.—A total of 122 cases of pulmonary tuberculosis with 77 deaths was reported. Clinic and dispensary services are provided at the University Medical School. A total of 135 beds is available in city, county, and State

institutions. The major part of the tuberculosis work done in the city is carried out by the State tuberculosis association, in cooperation with the visiting nurse association, the city health department paying one-third of the expenses.

Venereal diseases.—The reporting of venereal diseases by office number to the State department is required, only delinquent cases being reported to the local department. A total of 591 cases of syphilis, 1,181 of gonorrhea, and 135 other cases was reported. At the detention hospital for women, operated by the city health department, there were cared for 1,210 patients during the year.

Child hygiene.—Registration of midwives with the health department is required. A total of 1,335 expectant mothers was reported to have been cared for by the visiting nurse association at their homes, and clinics are operated at the University of Nebraska and Creighton University. Seven infant-welfare clinics are operated by the visiting nurse association, and these were attended by 401 babies, who paid 5,973 visits during the year. Nurses made 15,071 visits to homes of children under their care. Health supervision of children of the public schools is carried on by the board of education, which employs 1 physician and 19 nurses. Supervision of children of the parochial schools is carried on by the assistant health commissioner and 2 nurses of the health department. Children of all grades are given physical inspection by nurses. No physical examination is required for children applying for working papers, although it is provided that no children under 16 years may be employed in any industry. There are no public activities for the prevention of mental diseases and promotion of mental health.

Industrial hygiene.—There is no activity in this field locally.

Public-health nursing.—Three nurses were employed by the health department, 19 by the board of education, and 27 by the visiting nurse association, giving a ratio of 23.0 nurses per 100,000 population.

Laboratory.—A public-health laboratory is maintained, where 8,577 examinations for diphtheria, 101 examinations for tuberculosis, 1,297 milk analyses, and 116 water analyses were made during the year.

Food and sanitation.—An effort is made by the dairy and milk inspector to inspect the producing dairies within a radius of 15 miles every two weeks. The milk ordinance requiring that dairy herds be tuberculin tested once a year is enforced. Supervision over the production of certified milk is carried on by the health commission. Approximately 50 per cent of the milk supply is Pasteurized. All places where food is handled are inspected at intervals. General sanitary inspections are made as a result of citizens' complaints for the abatement of nuisances, and a clean-up campaign is carried on once a year. Plumbing inspection is still considered a function of the health department, as is the disposal of garbage and refuse.

Public utilities.—The public water supply owned by the city is derived from the Missouri River, and is treated by sedimentation, coagulation, filtration, and chlorination. It was stated that none of the 1 cubic centimeter samples of treated water showed *B. coli* present. Approximately 10 per cent of the population utilized private wells. The separate type of sewerage accommodated 90 per cent of the population, sewage being discharged untreated into the Missouri River.

Public-health education.—There is no special organization for this work. The health commission prepares special articles for the press and delivers occasional lectures on health topics before civic organizations.

Special comment.—Measures for the control of communicable diseases should be made to conform more closely with standards of the American Public Health Association. The department of health is still carrying a heavy burden

through its responsibility for garbage and refuse removal and plumbing inspection, functions which might more properly be carried on under some other department of municipal government, as they have relatively little connection with health-promotion activities. An effort should be made to train midwives so as to secure proper protection for mothers and infants, and the infant-welfare program should be extended. School health supervision should include a thorough medical examination of each child, including heart and lungs, at least three times during the school career. Pasteurization of milk should be encouraged.

PATERSON, N. J.

Paterson is an industrial city of 139,580 people, of whom 67 per cent are native white, 32 per cent foreign born, and 1 per cent colored. The population per square mile was 16,862. The total taxable valuation amounted to \$1,144 per capita.

Administration.—The form of organization consists of an appointive commission with administrative divisions of finance, health, education, police, fire, public works, recreation, and parks. There is a board of health of 7 members appointed by the mayor for 3-year terms. Meetings are held twice a month. The medical health officer is appointed by the board of health on a full-time basis for a 5-year term at a salary of \$5,500 a year.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.68 per capita, \$0.38 being for hospitals, and \$0.03 for plumbing inspections. This compares with \$0.56 per capita expended in 1920, of which \$0.26 were for health purposes proper.

Vital statistics.—The collection of vital statistics is a function of a special registrar of the health department, and checks of birth and death certificates are regularly made with satisfactory results. Monthly vital statistics reports are issued.

Communicable-disease control.—Reporting of communicable diseases is reasonably complete and measures for their control meet with accepted standards. Sixty per cent of the school children have been vaccinated against small-pox, and measures for the immunization of children against diphtheria by use of the Schick test and toxin-antitoxin measures have recently been instituted. There are 103 hospital beds per 100,000 population for communicable-disease cases.

Tuberculosis.—There were 287 cases with 120 deaths reported. One clinic is maintained by the Paterson tuberculosis league where 1,094 visits were made during the year, while 2,263 visits were made to homes in behalf of tuberculous cases. During the year 230 patients were admitted to city and State institutions.

Venereal diseases.—There were 172 cases of syphilis, 192 cases of gonorrhea, and 12 other cases reported by name and address. A Government clinic is held in the general hospital in addition to one private clinic. Hospital facilities for 12 patients are available at the isolation hospital.

Child hygiene.—Midwives, who attended 23 per cent of the births, are registered by the health department. There are 4 health department infant welfare clinics, where 2,282 babies were registered as having made 4,922 visits to clinics, while 2,119 nurses' visits were made to homes. Health supervision of children of the public schools is carried on by the board of education, with a part-time medical inspector in charge of the work. One physician for 3,000 children, and one nurse for 2,000 children are employed, in addition to one dentist for 4,000 children. A complete physical examination is given once a year to

children of all grades. The average daily attendance of public-school children totals 21,033, while 21,502 examinations were made and 9,465 defects discovered. A total of 5,232 defects was corrected during the year. Children applying for working papers are first required to pass a physical examination.

Industrial hygiene.—Nursing service is provided by individual concerns in certain cases, but otherwise this work is handled by the State department of labor.

Public health nursing.—Four nurses were employed by the health department and 13 by the board of education, and 3 by voluntary agencies, giving a ratio of 14.3 nurses per 100,000 population.

Laboratory.—In 1923 the State laboratory at Trenton was utilized. In 1924 a city public health laboratory was organized under trained personnel.

Food and sanitation.—Dairies producing milk for the city are inspected monthly by the health department staff. Forty per cent of the milk supply was Pasteurized. The per capita milk consumption amounted to 1 pint daily. General sanitary inspections are made as a result of citizens' complaints.

Public utilities.—The public water supply privately owned is derived from the Passaic River and is treated by rapid sand filtration and chlorination before being served to practically all of the people. Laboratory analyses of samples of treated water showed *B. coli* absent in 10 cubic centimeter amounts. The combined system of sewerage is employed and the sewage is discharged untreated into the Passaic River. There were 100 surface privies still in use in outlying districts supervised by the health department.

Public health education.—The health officer publishes an annual report of 300 copies and prepares occasional articles for the press.

Special comment.—Considerable progress has been made since 1920 in extending activities of the health department and in the development of the public health laboratory.²² There is still need for the extension of the child hygiene program to provide for prenatal service, and for the supervision of children of preschool age. Pasteurization of all milk not obtained from tuberculin-tested herds should be required.

PEORIA, ILL.

Peoria is a city of 79,675 population classified as 87.5 per cent native white, 10 per cent foreign born, and 2.5 per cent colored. The city occupies an area of 10 square miles, giving a population per square mile of 7,967. The total taxable valuation was \$518 per capita.

Administration.—A mayor and council govern the city. There is a board of health of seven members, composed of selected city officials, one of whom must be a physician. The commissioner of health is appointed on a part-time basis by the mayor at a salary of \$1,200 a year.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.29 per capita, \$0.10 being for health purposes proper and \$0.19 for hospitals.

Vital statistics.—Registration of vital statistics is a function of the health department. Information concerning the probable percentage of births reported is not available.

Communicable-disease control.—There is no information concerning the cases of various communicable diseases reported. Gaseous fumigation is still practiced after cases of typhoid, diphtheria, scarlet fever, smallpox, cerebrospinal

²² Since 1923, when this survey was made, still further marked progress has been made in the extension of official health services along modern lines.

meningitis, and acute anterior poliomyelitis. Excellent hospital facilities are available for communicable-disease cases, with 55 beds per 100,000 population.

Tuberculosis.—One tuberculosis clinic is conducted in the city hall, where 338 visits were made during the year. A total of 96 cases was admitted to the hospitals, there being 45 beds available in the municipal sanatorium.

Venereal diseases.—Reporting of venereal diseases is by office number to the State, but information as to the number of cases thus reported is not available in the local health department office. One clinic is operated in the city hall six days a week, for three hours each day.

Child hygiene.—There is no child-hygiene work carried on by the health department and no supervision exercised over midwives except by the State. A total of 596 children attended infant-welfare clinics during the year. Health supervision of children of the public schools is carried on by the board of education. A physical examination is given annually to children of the first, third, fifth, and seventh grades. There were 4,709 examinations made in 1923, with 1,223 defects discovered and 165 defects corrected. Children applying for working papers are required to pass a physical examination before being issued a certificate.

Public-health nursing.—One nurse was provided by the health department, 2 by the board of education, and 17 by voluntary agencies, giving a ratio of 25.1 nurses per 100,000 population.

Laboratory.—A total of 1,102 laboratory examinations was performed from May 17 to December 31, 1923.

Food and sanitation.—The dairies producing milk for the city are inspected from time to time by local and State health department officials. Seventy per cent of the milk supply was Pasteurized. The per capita milk consumption amounted to from 1 to 1.2 pints per day. Food establishments are inspected. Sanitary inspections are confined to abatement of nuisances.

Public utilities.—The public water supply, privately owned, is derived from wells, and is chlorinated before being served to 90 per cent of the population. It was stated that none of the 10-cubic-centimeter samples of treated water examined in the laboratory showed *B. coli* present. Both separate and combined systems of sewerage are employed and accommodated 75 per cent of the people, the sewage being discharged untreated into the Illinois River. There were 1,200 privy vaults still in use, although efforts are being made to secure their abandonment as rapidly as sewer connections are made possible.

Public-health education.—There is no special activity in this field, although the health officer utilizes the daily press.

Special comment.—Certificates of births and deaths should be regularly checked and verified for completeness and accuracy. Measures for the control of communicable diseases should be made to correspond more closely with modern standards, and an antituberculosis program should be developed. There is urgent need for measures for the protection of maternity and infancy, and health supervision of the children of the parochial schools should be instituted as soon as funds become available.

PHILADELPHIA, PA.

Philadelphia is an industrial city of 1,922,788 people classified as 70.5 per cent native white, 21.7 per cent foreign born, and 7.8 per cent colored. The population per square mile was 14,823 persons. The total taxable valuation amounted to \$1,775.

Administration.—A mayor and council govern the city. The department of public health includes the bureau of health and the bureau of hospitals. There is a board of health of three members who are physicians. The director is appointed by the mayor on a full-time basis at a salary of \$10,000 a year for a four-year term. He has broad administrative powers.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.34 per capita, including \$0.02 for plumbing inspection, and \$0.01 for housing inspection. This compares with \$0.39 per capita for health purposes proper expended in 1920, although the gross per capita expenditures of the health department in that year, including the director's office, the bureau of health, and the bureau of hospitals, amounted to \$2.15.

Vital statistics.—Registration of vital statistics is conducted by the health department, and certificates are checked for completeness and accuracy. It is probable that 95 per cent of the births and 100 per cent of the deaths are reported. Reports are issued weekly in the newspaper and monthly in the health department bulletin.

Communicable-disease control.—Reporting of communicable diseases is reasonably complete, and control practices conform for the most part to accepted standards, except for the isolation of measles cases as long as 16 days, and the continued use of gaseous fumigation after cases of smallpox. Hospitalization of communicable-disease cases is well carried out, as shown by the fact that 80 per cent of the cases of typhoid, 70 per cent of the case of diphtheria and scarlet fever, and 100 per cent of the cases of smallpox are thus cared for. All the school children are reported to have been vaccinated against smallpox, and 12,500 children have been protected against diphtheria by immunization measures.

Tuberculosis.—A total of 3,674 cases with 2,122 deaths was reported. There are 12 health department clinics where 5,209 patients were on active records as having made 13,922 visits during the year, while 18,294 visits to the homes of tuberculous cases were made by members of the clinic staff, 5,082 having been made by health department nurses. The total number of hospital and sanatoria beds available for Philadelphia cases is 1,450.

Venereal diseases.—Venereal disease reporting, in accordance with State regulations, is by office number to the local health department. There were 1,078 cases of syphilis, 1,417 cases of gonorrhea, and 299 other cases reported during the year. Clinic service is provided at the Philadelphia general hospital, where 432 cases of syphilis, 460 cases of gonorrhea, and 137 other cases were treated. Two social-service workers are employed for this work.

Child hygiene.—A division of child hygiene is organized in the health department. Nurses' visits in behalf of prenatal cases numbered 16,620. A total of 2,846 expectant mothers was registered as having attended prenatal clinics or as having been visited by health department nurses during the year. Nurses' visits in behalf of infants under 2 years of age number 186,382, while 70,323 children of this age period paid a total of 342,263 visits to the 43 infant welfare clinics conducted by the health department. Midwives are licensed and supervised by the State. A total of 10,877 children of ages 2 to 5, inclusive, visited preschool clinics during the year. Health supervision of children of private and parochial schools is exercised by the health department, while children of public schools are supervised by the division of medical inspection of the health department but under pay of the board of education. A physical examination is given children of all grades once a year, but this examination is not sufficiently complete to include lungs in all cases. A total of 254,074 children are enrolled in the public schools, and 227,148 examinations were made during the year. In all 236,679 defects were discovered and 123,156 defects corrected, 28,123 hav-

ing been corrected at clinics. Children applying for working papers are first required to pass a physical examination given by a medical inspector of the public schools or by a special physician chosen for this purpose. A mental hygiene clinic is operated by the Philadelphia general hospital.

Industrial hygiene.—This work is under the State department of labor and industry.

Public-health nursing.—Ninety-two nurses were employed by the health department, 93 by the board of education, 104 by the visiting nurse association, and 184 by other agencies, giving a ratio of 24.5 nurses per 100,000 population.

Laboratory.—A well-equipped public-health laboratory is operated in close association with the isolation hospital, in addition to a chemical laboratory maintained at the city hall. A total of 39 diagnostic examinations per 1,000 population was made during the year.

Food.—Systematic supervision is exercised over the milk and food supplies by a special division of the health department. There are no special regulations concerning the tuberculin testing of herds. Ninety-eight per cent of the milk supply was Pasteurized. The per capita milk consumption amounted to 0.7 pint daily, which is 0.3 pint less than the minimum standard. Food establishments are regularly inspected but not scored. Licenses are not required for their operation. Food handlers are examined twice yearly and must be free of communicable disease.

Sanitation.—The work is organized under the division of housing and sanitation. House-to-house inspections are made as frequently as deemed necessary, in addition to the routine inspections, as a result of citizens' complaints for the abatement of nuisances. Special measures are directed against flies, including requirements for tight manure bins and covered garbage pails.

Public utilities.—The public water supply, owned by the city, is derived from the Schuylkill and Delaware Rivers and is treated by sedimentation, coagulation, filtration, and chlorination before being served to 95 per cent of the population. Treatment and control measures are shown by laboratory analyses to be satisfactory. Both combined and separate systems of sewerage are employed and accommodated approximately 90 per cent of the population. About 8 per cent of the sewage is treated in Imhoff tanks, trickling filters, and settling basins before discharge of the effluent into near-by rivers. There were approximately 10,000 privy vaults in use in outlying districts of the city, under the supervision of the health department.

Public-health education.—The health department publishes an annual report of 400 copies and a monthly bulletin of 5,000 copies. Subjects pertaining to public health are discussed weekly or oftener in the press. The director and his staff give approximately 200 lectures during the year on health subjects before civic groups. Permanent exhibits have been prepared and are used in 10 health centers and at 12 chest clinics.

Special comment.—Progress has been made since 1920 in extending the child-hygiene program, but there is still need of increased appropriations to provide more adequate control of venereal diseases. Provisions should be made whereby the school medical examinations may be intensive enough to include both heart and lungs at least three times during the school career of each child.

PITTSBURGH, PA.

The population of Pittsburgh was 620,367, classified as 73.2 per cent native white, 6.4 per cent foreign born, and 20.4 per cent colored. The population

to the square mile was stated as 12,550 persons. The total taxable valuation amounted to \$1,497 per capita.

Administration.—A mayor and 9 councilmen govern the city. The department of public health consists of 5 bureaus. The director of health is appointed by the mayor for a 4-year term on full-time basis at a salary of \$7,000 a year.

Expenditures.—The expenditures of the health department in 1923 amounted to \$3.34 per capita, of which \$0.34 were spent for hospital, \$2.22 for garbage and refuse disposal, \$0.06 for plumbing inspection, and \$0.02 for smoke regulation, leaving \$0.70 for health purposes proper. Pittsburgh's per capita expenditure for the health department in 1920 amounted to \$2.87, of which \$0.81 were expended for health service proper.

Vital statistics.—The registration of vital statistics is under the direction of the State health department, and procedures are in accord with accepted standards.

Communicable-disease control.—There is an average of 3.5 cases of typhoid, 9 cases of diphtheria, 11.9 cases of scarlet fever, 49.3 cases of measles, and 3 cases of whooping cough reported for each annual death from these causes. These ratios, which are an indication of incompleteness of reporting, compare with those suggested by the appraisal form of the committee on health practice, as follows: Typhoid, 10 cases per death; diphtheria, 15; scarlet fever, 50; measles, 100; and whooping cough, 25 cases per death. There are 38.6 communicable-disease hospital beds per 100,000 population. It is stated that all of the school children have been vaccinated against smallpox.

Tuberculosis.—A total of 744 cases with 488 resident deaths was reported. The total number of clinic patients on active records as having been seen within the last 12 months was 250, while 350 clinic visits were made.

Venereal diseases.—As in 1920, whatever control there is of venereal diseases in Pittsburgh is provided under the direction of the State department of health.

Child hygiene.—There are no special prenatal clinics. Midwives are licensed by the State. In summer there are 20 infant welfare stations, and in winter there are 15, where a total of 17,076 infants were registered as having made 19,105 visits to clinics, while 6,450 nurses' visits were made to homes. The health department pays two-thirds of the salaries of physicians engaged in school health supervision, while the board of education pays one-third for a period of 10 months in addition to one-half of the nurses' salaries. Children of all grades are given complete physical examinations at least once a year. Data as to defects found and corrected are incomplete. Children applying for working papers must first pass a physical examination given by any physician. Special mental hygiene clinics are maintained by the board of education in addition to one clinic maintained by the department of public welfare.

Industrial hygiene.—There are no organized efforts in this field.

Public-health nursing.—Thirty-one nurses were employed by the health department, exclusive of those in hospitals, distributed as follows: Bureau of infectious diseases, 13 nurses; bureau of child welfare, 18 nurses. The nursing association also employed 67 nurses.

Laboratory.—A public-health laboratory is maintained where 159 diagnostic examinations per 1,000 population were made during the year.

Food.—Systematic supervision is exercised over the milk and food supplies of the city by the bureau of food control. It is required that all milk must be Pasteurized or come from tuberculin-tested herds, 97 per cent of the supply being Pasteurized.

Sanitation.—Inspections are made of tenement houses once a month, in addition to the general sanitary inspections for the abatement of nuisances. Plumbing inspection is still considered to be a function of the health department, as is the collection and disposal of garbage and refuse. The methods of garbage disposal consist of incineration and reduction. Measures for the prevention of fly and mosquito breeding are not exercised.

Public utilities.—The public water supply, owned by the city, is derived from the Allegheny River, and is treated by slow sand filtration and chlorination before being served to 93 per cent of the population. Laboratory analyses of 10-cubic-centimeter samples of the treated water showed *B. coli* absent. Both the combined and separate systems of sewerage are employed and were accessible for 96 per cent of the population. The sewage is discharged untreated into the river.

Public-health education.—There is no organized effort on the part of the health department to carry on health-education work.

Special comment.—There is chiefly needed a more active campaign for the protection of maternity and infancy and for the development of health education under the department of public health.

PORTLAND, OREG.

The population of Portland, Oreg., was 273,621, classified as 81.2 per cent native white, 18.2 per cent foreign born, and 0.6 per cent colored. The population per square mile was 3,896. The total taxable valuation amounted to \$1,682 per capita.

Administration.—The city is governed by a commission. There is no advisory council nor board of health. The health officer is appointed by the mayor on a full-time basis for an indefinite period at a salary of \$4,200. The health officer is given broad administrative powers by the mayor and city council.

Expenditures.—The health-department expenditures in 1923 amounted to \$0.43 per capita, \$0.10 being for hospitals. Of the total expenditures of the department of health in 1920, amounting to \$0.46 per capita, \$0.42 was for health purposes, which was then and still is below the average for this group of cities.³³

Vital statistics.—The collection of vital statistics is conducted by the city health officer serving as deputy registrar for the State. Checks of completeness of reporting births and deaths indicate that 98 per cent of the former and 90 per cent of the latter are reported. Published reports of vital statistics are issued annually and are distributed to health departments and libraries, as well as to others upon request.

Communicable-disease control.—Although the ratio of cases of typhoid to annual deaths is only half the number indicated for completeness of reporting, reporting of cases of diphtheria, scarlet fever, and measles is considered satisfactory. Reports of diseases are filed chronologically by disease. Release from isolation of cases of diphtheria and typhoid is based upon negative cultures. There were 27 hospital beds for communicable-disease cases per 100,000 population.³⁴

Tuberculosis.—There were 367 cases of tuberculosis reported with 206 deaths. Two clinics are operated weekly by the visiting-nurse association in addition to the clinic at the local dispensary.³⁵ Facilities for hospitalization of tubercu-

³³ In 1925 the total was \$0.53 per capita, of which \$0.43 was for health purposes.

³⁴ In 1925 there were 80.

³⁵ In 1925 four clinics were operated by the visiting-nurse association, two of these for children and partially financed by the Oregon Tuberculosis Association.

losis cases consist of 150 beds at the State sanatorium, 30 beds at the county home, 60 beds at the local sanatorium, and 75 beds for children in the open-air sanatorium of the city. There were 973 clinic patients registered as having made 1,725 clinic visits during the year, while 5,291 visits by nurses were made in behalf of tuberculosis cases.³⁶

Venereal diseases.—Notification, in accordance with State law, is by office number to the local health department. There were 694 cases of syphilis, 1,583 cases of gonorrhea, and 55 other cases reported during the year, while a total of 913 venereal-disease patients received 6,859 treatments at the clinic. At the county hospital 30 beds were available for venereal-disease patients and 120 persons benefited from these facilities in 1923.

Child hygiene.—Child hygiene activities are organized under the State board of health. There were 1,400 expectant mothers registered during the year. Of 5,045 live births, 26 per cent were attended by midwives, who are required to register and are supervised by the State. Five infant-welfare clinics are maintained by the visiting-nurse association, where 1,036 babies were registered as having made 2,436 visits to clinics. A total of 3,824 nurse's visits were made to homes in behalf of infants.³⁷ Health supervision of children of the public schools is carried on by a division of the city health bureau. A complete physical examination is given children from the first to the eighth grades, inclusive, once a year. Although physical examination of children applying for working papers is not required by law, it is reported that such examinations are given by physicians of the city. There are no special activities for the promotion of mental health.

Industrial hygiene.—The only activity in this field is carried on by the State industrial commission.

Public-health nursing.—Sixteen nurses were employed by the visiting-nurse association, giving a ratio of 5.8 nurses per 100,000 population. The health department supplements the budget of the visiting-nurse association to the extent of \$7,500 annually (in 1925, \$8,500).

Laboratory.—The usual free bacteriological and chemical laboratory service is provided for the community, there having been 44 diagnostic examinations per 1,000 population during the year (in 1925, 84).

Food and sanitation.—A total of 4,565 dairy inspections was made of the 1,200 producing dairies in 1923,³⁸ It is required that all herds from which raw milk is sold should be tuberculin tested once a year. Sixty per cent of the total milk supply was Pasteurized. The per capita consumption of milk was 0.9 pint daily.³⁹ Inspections are made at intervals, by the sanitary division, of food-handling establishments and restaurants, and the latter are inspected monthly. A physical examination is required made twice a year (in 1925 once a year) of all food handlers, 432,691 such examinations having been made. General sanitary inspection is carried on jointly with food control and consists largely in inspection for the abatement of nuisances. Housing inspection is a function of this division.

Public utilities.—The public water supply, owned by the city, is derived from the Bull Run River and serves all the people with water which is not treated except by storage. Laboratory samples are examined once a month by the health department. The combined system of sewerage is employed and was accessible for 70 per cent (in 1925, 85 per cent) of the population, the sewage

³⁶ In 1925 the figures were 1,521 patients, 3,613 clinic visits, and 9,329 nurse's visits.

³⁷ In 1925, 2,925 babies were registered and 9,062 visits to clinics and homes were made.

³⁸ In 1925, 5,427 dairy inspections were made.

³⁹ Considerably over 1 pint in 1925.

being discharged untreated into near-by rivers. There were 866 (350 in 1925) privy vaults still in use in three suburban districts.

Public-health education.—The health officer publishes an annual report of 525 copies and utilizes the press twice or three times a week. Lectures are given at intervals by members of the health department and nursing staff.

Special comment.—More generous appropriation for health purposes is needed to provide for an increased medical and nursing staff for communicable-disease control and in extending the program for the control of tuberculosis and the venereal diseases. Gaseous fumigation as a means of communicable-disease control should be abandoned. Children of the parochial schools as well as of the public schools should be given the benefit of health supervision to include a full medical examination for each child at least three times during its school career and the correction of defects. Stimulus should be given to increased Pasteurization of milk. More frequent analyses of the water supply with the maintenance of laboratory records would seem desirable.

PROVIDENCE, R. I.

Providence is an industrial city of 242,378 people, 52.4 per cent native white, 34.6 foreign born, and 13 per cent colored. The population per square mile was 12,997. The total taxable valuation amounted to \$2,194 per capita.

Administration.—The form of municipal organization consists of a mayor, council, and board of aldermen. The board of aldermen serves ex officio as a board of health. The superintendent of health is the executive officer elected by the city council for a term of three years on a full-time basis at a salary of \$6,000. The present superintendent of health has served in the health department for a period of 40 years.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.75 per capita, \$0.38 being for the collection and disposal of garbage and refuse, \$0.11 for mosquito control, \$0.01 for rodent control, and \$0.02 for medical poor relief. In 1920 the per capita expenditure amounted to \$0.72, \$0.39 being for health purposes proper.

Vital statistics.—The superintendent of health is registrar of vital statistics, and reporting of births and deaths is practically complete as shown by systematic checks and verification of data. Annual reports are published for distribution to physicians and other health departments.

Communicable-disease control.—Measures for the control of communicable diseases meet with accepted standards, and hospitalization is practiced to a commendable degree. Practically all the school children have been vaccinated against smallpox, and the use of the Schick test and toxin-antitoxin for immunization purposes has been instituted.

Tuberculosis.—Tuberculosis is reported to the State board of health. Clinic facilities are provided, where 2,161 visits were made during the year (354 new patients). Visits by nurses on behalf of tuberculosis cases numbered 24,955. There are 558 beds available for tuberculosis cases in city and State institutions. The Providence tuberculosis league supports various forms of work undertaken for the prevention of tuberculosis in childhood and infancy.

Venereal disease.—There were 365 cases of syphilis and 602 cases of gonorrhea reported to the State health department. Three hospitals in Providence maintain clinics for the diagnosis and treatment of venereal-disease cases. A total of 7,672 visits was made to clinics during the year, while 1,560 cases were followed by the social service worker to insure regular visits at clinic.

Child hygiene.—A division of child hygiene is organized in the health department under a full-time director. Nurses' visits in behalf of prenatal cases

numbered 1,742, while 968 prenatal cases visited clinics during the year. Nurses' visits in behalf of children under 2 years of age numbered 54,160. Midwives, who attended 19 per cent of the births, are licensed yearly by the State board of health and supervised by the city health department. A limited amount of work is done by the district nursing association with the preschool child in connection with their home nursing service, while a clinic for physical examination of the preschool children has recently been opened. Health supervision of children of public and parochial schools is carried on by the health department, there being one physician for approximately 6,500 children and one nurse for approximately 3,500 children. A complete physical examination is given each child four times during school life, in addition to special examinations on request of teachers and nurses. A total of 14,737 examinations was made in 1923, and 8,574 defects discovered, while 6,937 defects were corrected. Children applying for working papers are first required to pass a physical examination given by physicians appointed by the State board of education. A total of 2,463 certificates was issued during the year. The district nursing association has 10 nurses engaged in tuberculosis, including work in eight open-air rooms in the public schools, there being an average of 20 pupils in each room. One psychiatric clinic is operated for the examination of backward and atypical school children. The district nursing association also employs one nurse for mental hygiene nursing work.

Industrial hygiene.—There are no special industrial hygiene activities carried on by official agencies.

Public-health nursing.—A creditable plan of securing coordination of nursing activities of the official and voluntary agencies has been evolved. The city makes an annual appropriation to the nursing association and the superintendent of health is an ex officio member of its board of managers. Every year the superintendent of health and the director of the nursing association meet and plan their work so as to secure the best possible cooperation and the greatest efficiency. In 1923 the health department employed 19 nurses and the district nursing association 57, giving a ratio of 31.4 nurses per 100,000 population.

Laboratory.—The first municipal public-health laboratory in this country was founded at Providence for the purpose of studying sanitary problems. At present free diagnostic as well as chemical service is provided by the city in addition to the facilities offered in the State laboratory, a total of 9,432 examinations having been made in the city laboratory during the year.

Food and sanitation.—Although there are no city regulations governing the tuberculin testing of cattle, it is stated that the number of accredited herds is increasing gradually. Inspections are regularly made of 20 milk plants, in which 58.5 per cent of the total milk supply was Pasteurized. The total milk consumption per capita amounted to 0.8 pint daily. A physical examination is required to be made twice a year of food handlers. The health department inspects provision markets and stores. Bakeries and ice-cream factories are under the State factory inspector. General sanitary inspections are made chiefly as the result of citizens' complaints for the abatement of nuisances. The disposal of garbage under the health department is by feeding to pigs.

Public utilities.—The public water supply, owned by the city, is derived from the Pawtuxet River, and is treated by filtration and chlorination before being served to all the population. Laboratory analyses of 1 cubic centimeter samples of treated water showed *B. coli* present in 4.3 per cent of the samples. The combined system of sewerage is chiefly employed, sewer facilities being accessible for 97 per cent of the population. Treatment is by chemical

precipitation and disinfection with hypochlorite of lime before the discharge of the effluent into the river. There were 1,700 privy vaults still in use in districts beyond the present sewers.

Public-health education.—The superintendent of health publishes an annual report of 500 copies, and utilizes the press weekly. Members of the department deliver occasional lectures on public-health topics before clubs and teachers' organizations as well as in schools.

Special comment.—Since 1920 progress has been made in extending the child-welfare program, and valuable reports of vital statistics and health practice have been published. As pointed out in 1920, however, Providence is entitled to an increase for the needs of a proper child-welfare program, particularly for the extension of the program for children of the preschool age. Facilities are also needed for the development of a local tuberculosis service to supplement the activities of the State.

READING, PA.

Reading is a city of 110,917 people, classified as 90.2 per cent native white, 6.3 per cent foreign born, and 3.5 per cent colored. The population per square mile was 1,161. The total taxable valuation amounted to \$939 per capita.

Administration.—The form of municipal organization consists of a commission. The bureau of health is a division of the department of public safety. The five commissioners of the city government serve as a board of health and advisory council. The health officer is appointed by the commissioners for an indefinite term on a full-time basis at a salary of \$3,000 a year. It is required that the health officer be a practicing physician.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.46 per capita, including \$0.04 for plumbing inspection. This compares with \$0.39 per capita spent by the health department in 1920, \$0.27 being for health purposes.

Vital statistics.—The collection of vital statistics is an activity of the State department of health, the city bureau of health receiving data through a local registrar. Certificates are regularly checked for completeness and accuracy. The city is in the registration area for births and deaths.

Communicable-disease control.—The fact that only five cases of typhoid and eight cases of diphtheria for each annual death from these diseases are reported is an indication of incompleteness of reporting of these diseases. The standards of completeness used in the appraisal form of the Committee on Administrative Health Practice are approximately twice these ratios. All the school children are reported to have been vaccinated against smallpox. It is indicated that there are no facilities for hospitalization of cases of communicable diseases. Cases of typhoid are released from isolation only after two negative cultures of both stools and urine are secured, in accordance with modern procedure. Measures for the control of diphtheria by the use of toxin-antitoxin for immunization purposes have been undertaken, and approximately 1,500 persons were actively immunized in 1923.

Tuberculosis.—There were 52 cases with 70 deaths reported, indicating that cases of this important disease are not all reported to the health department. The number of nurses' visits in behalf of tuberculosis cases was 503, while 161 clinic patients were on active records during the year as having made 731 clinic visits. Fifty-one patients were admitted to State and county sanatoria.

Venereal disease.—There were 102 cases of syphilis, 172 cases of gonorrhea, and 295 other cases reported during the year, while 228 cases were treated in the venereal-disease clinic operated by the State.

Child hygiene.—Prenatal work is carried on by the child-welfare division of the health department, with the cooperation of the visiting nurse association. Prenatal clinic service is provided in connection with the nine infant-welfare clinics operated by the health department through the visiting nurse association. A total of 1,173 babies was registered at these clinics as having made a total of 18,457 visits during the year, while 24,894 nurses' visits were made to homes. Health supervision of children of the public schools was carried on by the board of education. A complete physical examination is given children of the grades, including high school, once a year. A total of 15,790 examinations was made in 1923 and 9,645 defects discovered, 203 of these being cardiac conditions and 832 enlarged glands. Of the defects discovered, 65 per cent of the teeth defects, 21 per cent of the tonsil conditions, 15 per cent of the eye defects, and 5 per cent of the gland defects were treated. Children applying for working papers are first required to pass a physical examination given by a school or private physician. A mental clinic is held once a month under the auspices of the State department of welfare.

Industrial hygiene.—Activities of the health department are restricted to the investigation of cases of industrial diseases reported to the health department. The State maintains a factory-inspection service.

Public-health nursing.—There were 32 nurses employed by the visiting nurse association, to which the health department contributed 50 per cent of the cost, 1 nurse by the health department, 9 by the board of education, and 3 by the State health department, giving a ratio of 39.6 nurses per 100,000 population for the city.

Laboratory.—A public-health laboratory is maintained in the city hall, where 34 diagnostic examinations per 1,000 population were made during the year, in addition to bacteriological and chemical milk analyses. Laboratory supervision of the water supply is carried on in the water-plant laboratory.

Food and sanitation.—There are 679 producing dairies within 25 miles of the city, and 171 farm inspections were made during the year by the local health department. Tuberculin testing is required of only those herds from which certified milk is sold. Ninety-seven per cent of the milk supply was Pasteurized. The total milk consumption amounted to 0.9 pint per capita. Inspections are made at irregular intervals of all food-handling establishments and a semiannual physical examination is required of food handlers. A semiannual house-to-house survey is made by the sanitary inspectors, in addition to the investigation of nuisance complaints. A division of plumbing inspection is organized in the bureau of health.

Public utilities.—The public water supply, owned by the city, is derived from mountain springs and streams and is treated by slow sand filtration and chlorination before being served to 98 per cent of the population. Laboratory analyses of 1-cubic centimeter samples of treated water showed *B. coli* absent. The separate type of sewerage is employed and is accessible for 85 per cent of the population. The sewage is treated by screening, trickling filters, and septic tanks before discharge of the effluent into the river. There were about 10,000 privy vaults in the city.

Public-health education.—The health officer publishes an annual report of 150 copies, utilizes the daily press, and delivers occasional lectures before civic clubs. A babies' welfare exhibit has been prepared and utilized by the visiting nurse association.

Special comment.—Need for an increased appropriation for health purposes is indicated. There is also needed one bed for each 2,000 of the population for the hospital care of acute communicable diseases. Additional hospital

facilities should also be provided for cases of tuberculosis to the extent of one bed for each annual death from this disease. Supervision of children of parochial schools should be provided at least to the extent made possible for children of the public schools. Health education should be developed.

RICHMOND, VA.

The population of Richmond was 181,044, classified as 65.7 per cent native white, 2.7 per cent foreign born, and 31.6 per cent colored. The city occupies an area of 25.5 square miles, giving a population per square mile of 7,100. The per capita valuation was \$1,607.

Administration.—The city is governed by a mayor and council. The mayor appoints four directors of administrative divisions. The health bureau is under the department of public welfare. There is a board of health of five members composed of the mayor and his four directors. The health officer is appointed by the director of public welfare on a full-time basis at a salary of \$4,750.

Expenditures.—The expenditures by the health department in 1923 amounted to \$0.62 per capita, including \$0.03 for plumbing inspection and \$0.04 for medical poor relief. This compares with the \$0.50 per capita expended by the department of health in 1920, \$0.49 of which was for health purposes.

Vital statistics.—Registration of vital statistics is conducted by the health department, and procedures correspond to accepted standards, certificates of both births and deaths being systematically checked for completeness, and classified tabulations being made and published.

Communicable-disease control.—Control of communicable diseases correspond in general with accepted standards except for the continued use of gaseous fumigation after cases of scarlet fever and smallpox. Only 1 per cent each of the cases of diphtheria and scarlet fever are hospitalized. Provision is made for hospitalization of these cases only in the event that persons are unable to pay for the proper care at home.

Tuberculosis.—There were 598 cases with 240 deaths reported. One city clinic is open four days a week for diagnosis and treatment, and 999 patients were cared for during the year, having made 1,771 visits to clinic, while 7,168 home-nursing visits were also made. There were admitted to municipal and State institutions during the year 211 patients from the city.

Venereal diseases.—Reporting of venereal-disease cases is by name and address and office number to the health department, there having been 1,000 cases of syphilis and gonorrhea reported. One clinic is operated jointly by the medical college and the health department, where 508 cases of syphilis, 351 cases of gonorrhea, and 10 other cases received treatment. No special provision is made for hospitalization of bed cases. Two nurses on duty at the clinic made 1,528 home visits.

Child hygiene.—Prenatal clinics are maintained by the instructive visiting nurse association, 450 expectant mothers having attended during the year. Of 4,389 live births, 18.7 per cent were attended by midwives licensed and supervised by State and municipal officials, while 331 births occurred in hospitals. Three infant-welfare clinics maintained by the health department were attended by 2,147 children under 2 years of age, who made 4,824 visits to clinic, while 2,545 home visits were made by nurses. Health supervision of children of the public schools is carried on by the board of education. Physical examinations of children of all grades below the high school are made on admission and every two years thereafter, examination of the heart and lungs being made

only in special cases. There were 11,965 examinations made and 7,267 defects discovered, a large percentage of them being corrected during the year. It is required that children aged 12 to 16 years applying for working papers be given a physical examination by a physician of the board of health before being issued a certificate. There is no organized activity by the city for the promotion of mental health.

Industrial hygiene.—This work by the city is limited to sanitary inspections of plants.

Public-health nursing.—There is a separate bureau of nursing. Nursing is organized in a division of child welfare with central supervision of nurses. The health department provided 15 nurses, the board of education 12 nurses, the instructive visiting nurse association 17 nurses, giving a ratio of 24.3 nurses per 100,000 population, working on the specialized plan.

Laboratory.—The usual free bacteriological and chemical laboratory service is provided for the community. The public-health laboratory is maintained jointly by the city and State, a total of 18,194 examinations having been made in 1923.

Food.—Systematic supervision of the milk supply is maintained from the source to the point of delivery. The 207 producing dairies are inspected and scored monthly. Tuberculin testing of all cattle from which raw milk is sold is required. The two milk plants, in which 98 per cent of the milk was Pasteurized, are inspected several times each month, special attention being given to the enforcement of temperature standards. In spite of the high grade of milk produced in Richmond, the per capita of consumption of 0.5 pint per day is considerably below the desired standard. Inspections are regularly made of stores, restaurants, bottling plants, and bakeries, and permits are required for the sale of foods. Physical examination of food handlers is made only in selected cases which are suspected of having communicable disease. Special regulations are enforced for proper sterilization of utensils.

Sanitation.—General sanitary inspections are made in routine and also as the result of citizens' complaints. Special measures are enforced for the prevention of fly and mosquito breeding.

Public utilities.—The public water supply, owned by the city, is derived from the James River and is treated by storage, coagulation, and chlorination before being served to 93.7 per cent of the population. Laboratory examinations of treated water showed *B. coli* present in 3.2 per cent of the 10-cubic centimeter samples. There were approximately 900 private wells still in use. Both the combined and separate types of sewerage systems are employed and were accessible for 96.7 per cent of the population. The sewage is discharged untreated into the James River. There were approximately 1,500 surface privies still in use. The health bureau enforces special regulations concerning their construction and fly proofing.

Public-health education.—The health officer publishes an annual report of 700 copies, utilizes the daily press and special exhibits, and delivers occasional lectures on general health topics in churches, schools, and before various civic organizations. He is cooperating in the development of a special course of health instruction in the public schools.

Special comment.—Progress has been made since 1920 in providing increased care for maternity and infancy, but this work may well be extended. Increased facilities for hospitalization of communicable-disease cases are needed, and health supervision of children of the parochial schools should be instituted. The physical examinations of school children should be sufficiently complete to include heart and lungs.

ROCHESTER, N. Y.

Rochester is a city of 317,867 people (local estimate 320,000), classified as 75.5 per cent native white, 24 per cent foreign born, and 0.5 per cent colored. The population per square mile was 2,333. The total taxable valuation amounted to \$1,192 per capita.

Administration.—The mayor appoints the heads of the various administrative divisions of municipal government including the department of public safety, public works, engineering, parks, charities, and public instruction. The commissioner of public safety appoints the health officer to serve during good behavior. The present health officer has served for 30 years in his present capacity and receives a salary of \$5,000 a year. The appointment and dismissal of subordinates, the issuing of orders, and the hearing of appeals from orders, as well as the abatement of insanitary conditions, are functions of the health officer. The department of health is organized according to the usual divisions, and the salaries paid are in proportion to that of the health officer.

Expenditures.—The total expenditures of the health department in 1923 amounted to \$0.83 per capita, \$0.13 being for hospitals, and \$0.04 for plumbing inspection. In 1920, \$0.73 per capita were expended, of which \$0.63 were for health purposes proper, the remainder being for hospital purposes.

Vital statistics.—Registration of vital statistics is conducted by a full-time registrar in accordance with modern procedure, and copies of reports are received by the health department. Certificates of births and deaths are checked for completeness and accuracy, and it is stated that probably 99 per cent of the births and 100 per cent of the deaths are reported. Death certificates from communicable diseases are routinely checked against disease reports, and deaths under 1 year and stillbirths are checked against reported births and stillbirths.

Communicable-disease control.—Measures for the control of communicable diseases follow accepted standards. Cases of typhoid are released from isolation only after negative cultures. There are 42 hospital beds per 100,000 population available for communicable-disease cases, and 25 per cent of the cases of typhoid, 20 per cent each of the cases of diphtheria and scarlet fever, and 100 per cent of the cases of smallpox are thus cared for. Ninety-nine per cent of the school children have been vaccinated against smallpox, while 10,000 children were immunized against diphtheria during 1922.

Tuberculosis.—There were 664 cases of pulmonary tuberculosis with 209 deaths recorded. Nurses' visits in behalf of tuberculosis cases numbered 3,097, while 2,264 clinic patients were on active records as having been seen during the year. In the county sanatorium there are 172 beds available for adults and 100 beds for children, the total admissions for the year numbering 258.

Venereal diseases.—There were 1,294 cases of syphilis and 291 cases of gonorrhea reported. Five clinics are provided by the health department and the general hospital, in charge of the deputy health officer. An active follow-up service to secure prompt reporting and proper treatment of cases of venereal diseases is maintained.

Child hygiene.—Of the 6,614 live births, 39 per cent occurred in hospitals, and 10 per cent were attended by midwives, who are supervised by the health department in accordance with State and city regulations. Prenatal clinics are maintained by the health department. There were 1,564 children under 2 years of age registered at the 18 health department clinics as having made 8,683 visits to clinics. Nurses' visits in behalf of infants of this age period numbered 11,220. Health supervision of children of the public and parochial schools is carried on by the health department, there being an average of

one nurse for 1,151 children. A complete physical examination is given each child annually, 60,000 examinations having been made in 1923. A total of 12,974 defects was corrected among school children during the year in addition to the cleaning of each child's teeth twice annually. Children applying for working papers are first required to pass a physical examination given by a health department physician. The health department employs a special medical examiner for mental-disease cases, and he cooperates with the director of special classes in schools.

Industrial hygiene.—There are no industrial hygiene activities carried on by official agencies.

Public-health nursing.—There is a special bureau of public-health nursing in the health department with central supervision by a supervising nurse. A total of 56 nurses was employed by the health department, and 33 by nonofficial agencies.

Laboratory.—A well-equipped public-health laboratory is maintained, where 36 diagnostic examinations per 1,000 population were made during the year, in addition to the Wassermann tests provided through the laboratory of the State department of health. Special researches are also carried on in the local laboratory.

Food and sanitation.—Systematic supervision is exercised over the milk supply and tuberculin testing of herds from which raw milk is sold is required. Ninety-five per cent of the milk supply was Pasteurized by the holding process. The per capita milk consumption amounted to 0.8 pint daily. Inspection of food stores and of general sanitary conditions is also a function of the health department subdivision of food and sanitation. Municipal meat inspections are limited to retail markets. House-to-house inspections of sanitary conditions are made annually and follow-up reinspections, in addition to the follow-up of citizens' complaints for the abatement of nuisances. Plumbing inspection is carried on by the health bureau.

Public utilities.—The public water supply, owned by the city, is derived from impounded lakes, and is treated by chlorination before being served to 94 per cent of the population. Laboratory analyses of treated water showed *B. coli* absent in 1 and 10 cubic centimeter samples. Both combined and separate systems of sewerage are employed, although the former predominate, and they were accessible for 95 per cent of the population. The sewage is treated by screening and Imhoff tanks before discharge of the effluent into Lake Ontario.

Public-health education.—The health officer publishes an annual report of 250 copies and a monthly bulletin of 1,000 copies, in addition to special health pamphlets. The daily press is utilized, and occasional lectures on health subjects are given by the health officer and members of his staff. Special exhibits have been prepared for educational purposes.

Special comment.—Progress has been made since 1920 in extending the child hygiene program, but it would seem that provision should still be made for the care of the preschool child. The proportion of the milk supply Pasteurized has increased from 40 per cent to 95 per cent since 1920. Stimulus might well be given to the increase in the use of milk to the desirable daily amount of 1 pint per capita.

ST. JOSEPH, MO.

The population of St. Joseph was 78,232, classified as 82 per cent native white, 11 per cent foreign born, and 7 per cent colored. The total taxable valuation amounted to \$888 per capita.

Administration.—The city is governed by a mayor and council. There is a board of health of three members appointed by the mayor for a term of three years to approve the budget, to pass on regulations, and to act as general advisor to the health officer. The health officer is appointed by the board, with the approval of the mayor, for an indefinite term at a salary of \$2,400 on a part-time basis.

Expenditures.—The total expenditures of the health department in 1923 amounted to \$0.38 per capita, \$0.26 of which were devoted to health purposes proper and \$0.12 to hospitals.

Vital statistics.—Registration of vital statistics is conducted by a special registrar, and reports of births and deaths are received by the health department. It is stated that probably 98 per cent of the births and 100 per cent of the deaths are reported.

Communicable-disease control.—Reporting of communicable diseases is satisfactory. Gaseous fumigation is still practiced as a measure of control of the common communicable diseases. Ninety per cent of the school children have been vaccinated against smallpox. There are 53 hospital beds available for communicable-disease cases.

Tuberculosis.—There were reported 63 cases of tuberculosis, with 39 deaths, a low ratio, indicating incomplete reporting, and 271 patients were on the active records of the clinic as having made 595 visits, while 1,351 visits were made to homes by nurses.

Venereal diseases.—Reporting of venereal diseases is by office number to the local health department, 114 cases of syphilis, 134 cases of gonorrhea, and 8 other cases having been reported. One clinic is maintained by the Red Cross, where 250 cases of syphilis and 170 cases of gonorrhea were treated during the year. One nurse assists at the clinic and in home follow-up work.

Child hygiene.—Midwives are required to register and must have a State license. There is one infant-welfare clinic conducted by voluntary agencies, where 283 infants were registered during the year as having made 832 visits to the clinic. A total of 5,400 nurses' visits were made in behalf of infants. Health supervision of children of the public schools is carried on by the board of education, but medical examination of children is provided only in special cases. Children of the second, fourth, sixth, and eighth grades are given a physical inspection once a year by nurses, in addition to the nurses' other activities in home follow-up work. Children applying for working papers must pass a physical examination, given by a school or private physician, before being issued a certificate. There are no municipal activities for promotion of mental health.

Public-health nursing.—Four nurses were provided by the board of education and nine by voluntary agencies, giving a ratio of 16.6 nurses per 100,000 population.

Laboratory.—A total of 13 diagnostic specimens per 100,000 population was examined during the year, in addition to 2,005 examinations of milk and water.

Food and sanitation.—Dairies are inspected twice a year, while tuberculin testing of all herds is required by ordinance. The proportion of milk which was Pasteurized is unknown. Inspections are made at irregular intervals of food establishments, and permits are issued to milk plants. General sanitary inspections are limited to abatement of nuisances.

Public utilities.—The public water supply, privately owned, is derived from the Missouri River and is treated by sedimentation, filtration, and chlorination before being served to 90 per cent of the population. None of the 1-cubic

centimeter samples of treated water examined in the laboratory showed *B. coli* present. The combined system of sewerage is chiefly employed and was utilized by 75 per cent of the population, the sewage being discharged untreated into the Missouri River. There were 260 privy vaults, and 56 cess-pools still in use, although efforts are being made to secure their abandonment in sewered areas.

Public-health education.—There is no special activity in this field.

Special comment.—The health appropriation of St. Joseph should be materially increased in order to provide for modern methods of health promotion and disease prevention. This should also provide for a larger salary for the health officer for full-time service. Gaseous fumigation as a measure of communicable-disease control should be abandoned. Measures for the protection of maternity should be instituted, and the program of child hygiene should be extended to include supervision of children of preschool age, as well as medical supervision of school children of both public and parochial schools. Closer supervision of the milk supply should be exercised, and Pasteurization should be required and defined by ordinance.

ST. LOUIS, MO.

The city of St. Louis had a population of 803,853 people, with a population per square mile of 13,000. The total taxable valuation amounted to \$888 per capita.

Administration.—A mayor and board of aldermen govern the city. There is no advisory council and no board of health. The health commissioner is appointed by the director of public welfare on a full-time basis for a term of four years, at a salary of \$6,000. He has broad administrative powers.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.35 per capita, all of which was for health purposes proper, including \$0.01 for mosquito control. This is one of the lowest per capita appropriations for a city of this class. In 1920 St. Louis spent \$0.34 per capita, the largest amounts being expended for control of communicable disease, sanitary food inspection, and administration.

Vital statistics.—The health commissioner serves as registrar of vital statistics. Birth and death certificates are regularly checked and the data are classified by nativity, sex, age, cause, and color. Weekly summaries are made and monthly reports are issued, chiefly to physicians. It is stated that probably 80 per cent of the births and 100 per cent of the deaths are reported.

Communicable-disease control.—With the exception of typhoid fever, reports of the principal epidemic diseases are reasonably complete. There are 31 hospital beds per 100,000 population available for cases of communicable diseases. Cases of typhoid are isolated for a period of 21 days, and release is not based upon bacteriological evidence.⁴⁰ Ninety-nine per cent of the school children have been vaccinated against smallpox.

Tuberculosis.—A total of 888 deaths and 1,608 cases of this disease was reported. The number of visits by nurses in behalf of tuberculous cases totals 11,357, while 9,842 visits were made to the municipal health center. A total of 495 beds for adult patients and 50 beds for children is available in city and county institutions. It is stated that the 34 municipal visiting nurses devote half of their time to tuberculosis cases, while bedside nursing is done by the visiting nurse association.

⁴⁰ Since June, 1924, cases of typhoid fever have been terminated only after negative bacteriological findings.

Venereal disease.—Legal provisions require that cases be reported by office number to the local health department, and 2,186 cases of syphilis, 2,748 cases of gonorrhea, and 967 other cases were reported during the year. One municipal and four private clinics are maintained, where 2,216 cases of syphilis, 2,576 cases of gonorrhea, and 1,167 other cases were treated during the year. One social-service worker is provided by the city clinic. There are 144 hospital beds available for venereal-disease cases.

Child hygiene.—Of the 15,226 live births it is reported that 24 per cent were attended by midwives, who are licensed in accordance with the State sanitary code. Approximately 30 per cent of the births occur in hospitals. There were registered 1,073 expectant mothers, most of whom attended prenatal clinics maintained by the municipal nurse organization. There are 10 infant-welfare clinics operated by the municipal nurse association, in addition to five other clinics by voluntary agencies. The attendance at the 10 clinics of the hospital department numbered 4,573 babies and public-school children, who paid 32,157 visits, while 23,026 nurses' visits were made to homes. Health supervision of the children of the parochial schools is carried on by the board of education, there being an average of one nurse for 4,200 pupils and one physician for 8,000 pupils. A complete physical examination is given each child once a year. During the year there were 72,160 examinations made, 36,669 defects discovered, and 11,637 defects corrected. It is required that children applying for working papers must pass a physical examination given by the school hygienist.

Mental hygiene.—The city has a psychiatric clinic, to which cases are referred by the city courts. Patients outside of the city who are cared for by municipal institutions are paid for by the State. A State mental hygiene society cooperates with the city in its activities in this field.

Industrial hygiene.—The health department investigates cases of illness reported at the plants of various industrial concerns. The major activities in industrial hygiene are carried on by individual plants.

Public-health nursing.—There were 34 nurses employed by the hospital department, 28 by the board of education, and 46 nurses by the visiting nurse association, giving a ratio of 13.4 nurses per 100,000 population.

Laboratory.—A well-equipped public health laboratory is maintained, where 37 diagnostic examinations per 1,000 population were made during the year, in addition to bacteriological and chemical examinations of water and milk.

Food.—Inspections are made at intervals of dairy farms and milk plants. State regulations require that herds be given tuberculin tests every six months. Ninety-eight per cent of the milk supply was Pasteurized. The per capita consumption of milk averaged 0.6 pint daily, which is 0.4 pint less than the desired standard. Inspections are made of food-handling places, which are also licensed.

Sanitation.—Periodic house-to-house inspections are made in addition to the general sanitary inspections resulting from citizens' complaints for the abatement of nuisances. An annual clean-up campaign is carried out each spring. Housing inspection of occupied dwellings is also a function of the health department, particular attention being given to tenement houses. Special measures are directed against fly breeding and include efforts to secure prompt disposal of stable manure. Measures for the control of mosquitoes include oiling and ditching. A rat campaign is carried on each year, as this is considered an important problem locally.

Public utilities.—The public water supply, owned by the city, is derived from the Missouri River and is treated by coagulation, sedimentation, filtration, and chlorination before being served to all of the people. Laboratory analyses of the 1-cubic centimeter samples of treated water showed *B. coli* present in 0.2 per cent of the cases. A combined sewerage system is employed and was accessible for 90 per cent of the population, the sewage being discharged untreated into near-by rivers.

Public-health education.—The health officer publishes a monthly bulletin of 8,000 copies and a monthly statistical report of 200 copies, while lectures are given at intervals by the health-department staff.

Special comment.—Considerable appropriation and service for health purposes are available through the department of education, the hospital, the department of public safety, and private agencies, but there still seems to be a lack of coordination of activities. There is need for increased appropriation for the health department in order that communicable-disease control work and infant-hygiene activities may be extended. Children of the parochial schools should be given the benefit of complete physical examinations, and efforts should be made to secure the early correction of defects found among the school children.

ST. PAUL, MINN.

The population of St. Paul was 241,891, with a population per square mile estimated at 5,225 people. The total taxable valuation amounted to \$1,004 per capita.

Administration.—The city is governed by a mayor and council. There is no board of health nor advisory council. The department of public safety includes the health department as well as police and fire prevention. The health officer is appointed by the commission for a term of two years at a salary of \$4,000. It is required that the health officer be a physician licensed to practice medicine in the State.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.57 per capita, \$0.43 being for health purposes proper, \$0.03 for hospitals, \$0.08 for public baths, \$0.02 for comfort stations, and \$0.01 for dog catcher. In 1920, \$0.70 per capita was spent by the health department.

Vital statistics.—Registration of vital statistics is conducted by the State through a local registrar, who submits copies of reports to the health department. It is stated that 99 per cent of the births and 100 per cent of the deaths are reported. Monthly reports are issued by the registrar and distributed to physicians and libraries to the extent of 500 copies.

Communicable-disease control.—The ratio of reported cases to deaths for typhoid and diphtheria is somewhat lower than the standards suggested by the appraisal form of the American Public Health Association, but the reporting of scarlet fever, measles, and whooping cough seems to be more satisfactory. Seventy-five per cent of the cases of typhoid and 50 per cent each of the cases of diphtheria, scarlet fever, and smallpox are hospitalized. It is estimated that less than 25 per cent of the school children have been vaccinated.

Tuberculosis.—There were 449 cases of tuberculosis reported with 232 deaths. One clinic is located in the city, and one preventorium large enough to accommodate 75 children who come from homes where there are active tuberculous cases but who are not themselves active. A city and county hospital has facilities for 125 adult patients. A total of 9,734 nurses' visits was made to homes of tuberculous cases during the year.

Venereal diseases.—Reporting of venereal diseases according to State law is by office number to the State board of health. At the city hospital and dispensary 62 cases of syphilis and 123 cases of gonorrhea were treated during the year.

Child hygiene.—Prenatal clinic service is provided by the baby-welfare association. Of 6,087 live births, 12 per cent were attended by midwives supervised by the State. A total of 3,946 babies was registered at the infant-welfare station maintained by the voluntary agencies, and 10,708 visits were made to these clinics. Nurses' visits to prenatal and infant-welfare patients numbered 21,991. Health supervision of children of the public schools is provided by the department of education under the full-time supervision of a medical director. A physical examination is given from three to four times during the school life, but this examination is not sufficiently complete to include heart and lungs in routine. A total of 14,712 children was examined during the year and 36,044 defects found were corrected. A physical examination is required of children applying for working papers. Mental-hygiene cases from this city are referred to a child's guidance clinic organized under the auspices of the Commonwealth fund.

Industrial hygiene.—Certain industrial plants employ physicians and nurses, but there is no official activity in this field.

Public-health nursing.—Seven nurses were employed by the health department, 23 by the department of education, and 15 by voluntary agencies, giving a ratio of 18.5 nurses per 100,000 population.

Laboratory.—A public-health laboratory provides the usual free services for the community, 110 diagnostic examinations per 1,000 population having been made during the year.

Food.—Dairy farms from which milk is sold raw are inspected and scored annually. All herds from which raw milk is sold are tuberculin tested once a year. Eighty per cent of the milk supply was Pasteurized. Inspections are made of markets and restaurants, and licenses are issued to groceries, hotels, restaurants, and all retail food establishments.

Sanitation.—Inspections are made by sanitary inspectors for the abatement of nuisances, for the proper care of dumps, and for the placarding of houses where communicable-disease cases exist. Tight, covered boxes are required for the storage of stable manure. There are no special measures directed against mosquito breeding except the occasional oiling of pools.

Public utilities.—The water supply, owned by the city, is derived from lakes and wells and is treated by rapid sand filtration and chlorination before being served to 99 per cent of the population. The laboratory analyses of 10 cubic centimeter samples of the treated water showed *B. coli* present in 1 per cent of the samples. The combined system of sewerage is employed and accommodated 85 per cent of the population. The sewage is discharged untreated into the Mississippi River.

Public-health education.—An annual report of 1,000 copies and a monthly bulletin of 500 copies are published. The health officer utilizes the press for special health stories at irregular intervals.

Special comment.—It is believed that the term of office of the health officer is too short and that provision should be made for full-time services. The isolation period for typhoid fever should be controlled by cultures of stools or otherwise. Children of both public and parochial schools should be given the benefit of a medical examination sufficiently complete to include heart and lungs at least three times during their school careers. The budget of the health

department should be increased to provide for an increased nursing staff, and for the extension of the program for the control of tuberculosis and venereal diseases, as well as for the extension of the child-hygiene program to include the preschool child.

SALT LAKE CITY, UTAH

Salt Lake City is an industrial community of 126,241 (local census 131,600), estimated as of July 1, 1923, 82.9 per cent of whom are native white, 16.5 per cent foreign born, and 0.6 per cent colored. The population per square mile was estimated at 2,495 persons. The total taxable valuation amounted to \$1,452 per capita.

Administration.—The city is governed by a mayor and commission consisting of five members. There is a board of health of five members appointed by the city commission, the commissioner of public safety acting as ex officio chairman of the board. The health commissioner is appointed by the city commission for an indefinite term at a salary of \$3,300 per year on a part-time basis. He has broad administrative powers. It is provided by ordinance that the health commissioner and the assistant commissioner shall be medical graduates.

Expenditures.—The total health department expenditures amounted to \$0.82 per capita, \$0.06 being for hospitals, \$0.04 for medical relief to the sick poor, \$0.03 for comfort stations, and \$0.03 for weights and measures inspection. Expenditures in 1920 totaled \$0.84 per capita, of which \$0.73 was for health purposes proper.

Vital statistics.—Registration of vital statistics is conducted by the health commissioner. It is indicated that probably 98 per cent of the births and 100 per cent of the deaths are reported.

Communicable-disease control.—Reporting of principal communicable diseases seems to be fairly complete for diphtheria, scarlet fever, measles, and whooping cough, but is low for typhoid fever, there being 31 cases reported with 5 deaths. Cases of scarlet fever are isolated 30 days and those of whooping cough 35 days. It is stated that 5 per cent of the cases of typhoid, 2 per cent each of the cases of diphtheria and scarlet fever, and 50 per cent of the cases of smallpox are hospitalized. It is stated that 70 per cent of the school children have been vaccinated against smallpox.

Tuberculosis.—The fact that 79 deaths from tuberculosis were recorded, with only 64 cases reported, suggests incompleteness of reporting of this important disease. However, Salt Lake City's position as a hospital center, to which people from surrounding areas are brought for hospital care, should be considered, as such cases would not be reported locally until death occurred. One general clinic is maintained by the health department for diagnostic purposes and 25 hospital beds are available in the county hospital. A total of 116 city and county cases was admitted during the year. There were 230 visits made to homes of tuberculous patients by a municipal nurse who gives part-time service to this work.

Venereal disease.—There is a law requiring the reporting of cases of this disease to the State board of health. A total of 99 cases of syphilis, 224 cases of gonorrhea, and 12 other cases was reported through the venereal-disease clinic conducted by the city health department. One nurse is connected with the clinic for clinic and home follow-up service.

Child hygiene.—Midwives are registered by the State board of registration. There is one infant-welfare clinic conducted by the health department, to which a total of 9,995 visits was made during the year, while 593 nursing

visits were made to homes. There is no organized prenatal work. One nurse and one part-time physician employed by the board of education conduct preschool clinics at four school buildings where 240 children were registered. School health supervision in the public schools is directed by a physician employed by the board of education. Nurses work out of the health department and as a part of the division of epidemiology. A physical inspection is made of all children on admission and periodically thereafter. Suspicious cases, or those presenting serious physical defects, are referred to local physicians. There are no mental-hygiene activities carried on locally. A physical examination of children applying for working papers is not a requirement, although the State law does not permit a child under 18 years of age to be employed without a certificate from the school board of the district where it lives or has completed a high-school course or its equivalent. Between the ages of 14 and 18 a work permit may be secured for sufficient reasons, but the child must attend school at least four hours a week.

Industrial hygiene.—There are no industrial hygiene activities carried on locally.

Public-health nursing.—A total of 18 nurses was employed by the health department, 1 by the school board and 5 by the visiting nurse association, giving a ratio of 19 nurses per 100,000 population.

Laboratory.—A total of 3,696 examinations was made in the health department laboratory, 1,022 of these being bacteriological analyses of water, while 1,836 were diphtheria examinations.

Food and sanitation.—Permits are required of milk dealers and inspections are made weekly. Tuberculin testing once a year of all herds is required. It was stated that 95 per cent of the milk supply was Pasteurized. Inspection of food stores is regularly carried on, and licenses are required for milk dealers and meat markets. General sanitary inspections are made in routine as well as in the follow-up of complaints. Special measures are directed against mosquito breeding and fly breeding through cooperation between the county and city boards of health.

Public utilities.—The public water supply, owned by the city, is derived from mountain streams, and is chlorinated before being served to 98 per cent of the population. Laboratory analyses of the treated water showed *B. coli* present in 3.5 per cent of the 1-cubic centimeter samples. Only a few private supplies exist in sparsely settled sections of the city where the cost of extension of the public supply is considerable. The separate system of sewerage is employed and accommodated 96 per cent of the population, the sewage being discharged raw into Great Salt Lake. There were still approximately 1,200 privies in use, chiefly in outlying districts.

Public-health education.—The health commissioner publishes a monthly bulletin of 300 copies and his annual report of 500 copies. The press is utilized in weekly reports of communicable-disease incidence. The Utah Public Health Association and the Salt Lake Civic Center hold meetings and public lectures dealing with public-health subjects.

Special comment.—There is needed a sufficient increase in appropriation for the health department to provide for full-time health officer service. Inspection of children in schools should include the thorough medical examination of each child at least three times during the school career, and this service should be made available for parochial and private school children as well as those attending public schools. Stimulus should be given to the reporting of tuberculosis cases, and an increased nursing staff should be provided for clinic and home follow-up work.

SAN ANTONIO, TEX.

San Antonio is a city of 184,727 people, classified as 68.4 per cent native white, 22.7 per cent foreign born, and 8.9 per cent colored. The total taxable valuation amounted to \$975 per capita. The population per square mile was given as 5,500.

Administration.—The city is governed by a commission. There is a board of health of eight members, of whom the mayor, the commissioner of sanitation, the secretary of the board of health, and the city health officer are ex officio members. The remaining members are appointed by the mayor, and all of them are registered physicians. The terms of office coincide with that of the mayor. The health officer is appointed by the mayor at a salary of \$3,600 on a part-time basis.

Expenditures.—The health department expenditures in 1923 amounted to \$0.34 per capita, all of which was for health purposes proper. In 1920, \$0.43 per capita was devoted to health services, while in 1924, \$0.52 per capita was expended.

Vital statistics.—The city is in the registration area for deaths, but not for births. A report of vital statistics is published monthly. Death certificates from communicable diseases are routinely checked against disease reports.

Communicable-disease control.—The fact that an average of only 3.5 cases of typhoid, 5.5 cases of diphtheria, and 35 cases of measles for each annual death from these diseases were reported suggests that these diseases are not reported to the health department as promptly or completely as would be desired. There are 16 hospital beds per 1,000 population available for communicable-disease cases. It is estimated that 75 per cent of the general population are vaccinated against smallpox.

Tuberculosis.—A total of 65 cases of tuberculosis (all forms) with 467 deaths was reported. It is also stated that only 10 cases of this disease per year are sent to the State sanatorium, there being no more room for additional cases. A private clinic is operated six days a week, where 975 patients were brought under observation during the year.

Venereal diseases.—A total of 1,721 cases was reported through the clinic maintained by the health department, where 31,200 visits were made during the year. Cases are required reported by office number, but this regulation here, as in many other cities, is apparently not enforced.

Child hygiene.—A total of 781 births occurred in hospitals, while 787 were attended by midwives who are not supervised locally. Health supervision of children of the public schools is carried on by nurses employed by the board of education. The total enrollment in the public schools is 28,889, among whom were discovered 9,742 defects, 5,120 defects having been corrected during the year. Information is lacking as to whether children entering industries must first pass a medical examination.

Industrial hygiene.—There is no activity in the field of industrial hygiene.

Public-health nursing.—Public-health nursing is specialized in character, 7 nurses being employed by the health department, 4 by the board of education, and none by voluntary agencies.

Laboratory.—A public-health laboratory is maintained, where 42 diagnostic examinations per 1,000 population were made during the year, in addition to bacteriological and chemical analyses of water and milk.

Food and sanitation.—A sanitary inspector is maintained chiefly for the abatement of nuisances. A total of 14,682 physical examinations was made of food handlers during the year, while 22,802 inspections and reinspections were made of food-handling establishments. The per capita milk consumption

amounted to 0.5 pint daily, which is half the desired standard. Tuberculin testing is required of the dairy herds, and 65 per cent of the milk supply was Pasteurized.

Public utilities.—The public water supply is derived from artesian wells and served 96 per cent of the population with water which is untreated. The separate sewerage system accommodated 65 per cent of the population, the sewage being discharged untreated into a near-by lake.

Public-health education.—The health officer issues a monthly bulletin and occasionally utilizes the daily press with health stories.

Special comment.—It is suggested that children of the parochial schools as well as of the public schools should be given the benefit of a complete system of health supervision, including a medical examination at least three times during their school careers. Increased appropriations are needed for the health department in order that the child-hygiene program may be extended. Early reporting of cases of communicable diseases, including tuberculosis and venereal diseases, should be stimulated, and emphasis might well be given to the value of Pasteurization of milk.

SAN DIEGO, CALIF.

San Diego is a residential city of 87,126 population. The total area of the city is 100 square miles, giving a population per square mile of 871. The total taxable valuation was \$1,242 per capita.

Administration.—The city is governed by a mayor and five councilmen, with a city manager. There is a board of health of five members appointed by the mayor with confirmation by council to serve for terms of four years each. The health officer is appointed on a part-time basis for an indefinite term, not under civil service, at a salary of \$2,400 a year. He has broad administrative powers.

Expenditures.—The total health department expenditures in 1923 amounted to \$0.82 per capita, including \$0.31 for hospitals. In 1920, \$0.78 per capita were expended by the health department, \$0.61 having been for health purposes and \$0.17 for hospital service.

Vital statistics.—Registration of vital statistics is conducted by the health officer and follows accepted standards, 95 per cent of the births and 100 per cent of the deaths being reported. Reports are issued in the monthly bulletin.

Communicable-disease control.—Reporting of the principal communicable diseases is satisfactory. Special control measures conform in general to the standards of the American Public Health Association, and hospitalization is well carried out. Vaccination of school children is not compulsory and only 50 per cent of the school population have been vaccinated.

Tuberculosis.—There were 222 cases reported with 131 deaths. There is one tuberculosis clinic where 170 patients were on active records during the year as having made 1,474 clinic visits. The number of visits made by nurses in behalf of tuberculous cases was 2,745. There were 108 hospital beds available for city cases in city and county institutions, 173 patients having been admitted during the year.

Venereal diseases.—Reporting in accordance with State law is by office number to the local and State health departments. There were 135 cases of syphilis and 207 cases of gonorrhea reported, while 117 cases of syphilis and 109 cases of gonorrhea were treated at the health department clinic.

Child hygiene.—Of the 1,992 live births, 60 were attended by the four midwives practicing in the city under State and local supervision. There is one prenatal clinic maintained under the division of child hygiene, while four

infant-welfare clinics registered 755 children under 2 years of age. A total of 2,014 nurses' visits was made to children of this age period. Health supervision of children of the public schools is maintained by the board of education. A physical examination, which is not sufficiently complete, however, to include heart and lungs, is given all children of the kindergarten, elementary grades, and high schools on admission and periodically thereafter. There were 11,105 examinations made during the year and 6,215 defects discovered, but records are not complete as to the proportion of these defects corrected. Children applying for working papers are not required to pass a physical examination before being issued a certificate. There is no special activity for the promotion of mental health.

Industrial hygiene.—There is no special activity in this field.

Public-health nursing.—Each division of the health department has its own nurses. There were 4 nurses provided by the health department, 10 by the board of education, and 2 by voluntary agencies, giving a ratio of 18.3 per 100,000 population.

Laboratory.—The usual free bacteriological and chemical examination service is provided, 65 diagnostic examinations per 1,000 population having been made.

Food and sanitation.—Inspections are regularly made of dairies, milk plants, food establishments, and of general sanitary conditions. Tuberculin testing of all cattle is required, made by State veterinarians. Forty-seven per cent of the milk supply was Pasteurized. The total per capita milk consumption amounted to 0.9 pint daily. Plumbing inspection is still handled by the department of health.

Public utilities.—The impounded public water supply, owned by the city is filtered and chlorinated before being served to 99 per cent of the population. Examinations of the treated water showed *B. coli* present in 3 per cent of the 10-cubic centimeter samples. The combined sewerage system was utilized by 90 per cent of the population, the sewage being discharged untreated into the bay.

Public-health education.—There is no organized public-health education work in the city.

Special comment.—Progress has been made in providing for the care of maternity and infancy. Provision should be made for health supervision of children of the parochial schools, and physical examinations of all school children should be sufficiently complete to include examination of heart and lungs at least three times during school life. Medical examination should be required before children are permitted to enter industry. Gaseous fumigation as a means of controlling communicable disease should be abandoned. Health education might well be developed.

SAN FRANCISCO, CALIF.

San Francisco was credited with a population of 539,038 people, of whom 70 per cent were native white, 27 per cent foreign born, and 3 per cent colored. The city occupies an area of 46.5 square miles, giving a population per square mile of 11,592. The taxable valuation was \$1,142 per capita.

Administration.—A board of health of seven members, three of whom must be physicians, is appointed by the mayor for a term of seven years, one retiring each year. The medical health officer is appointed on a full-time basis, under civil-service regulations, to serve during good behavior as city and county health officer at a salary of \$7,500. The health officer has the power to promulgate special emergency regulations, but the appointment and

dismissal of subordinates, the fixing of salaries, the making of rules and regulations, the issuing of orders, and the hearing of appeals rest with the board of health.

Expenditures.—The expenditures of the department in 1923 amounted to \$2.90 per capita, of which \$1.69 was for hospital care, \$0.67 for poor relief, \$0.02 for plumbing inspection, and \$0.02 for miscellaneous activities, leaving \$0.50 for health purposes proper. In 1920 \$2.89 per capita was expended, but of this amount \$2.43 was for hospital care.

Vital statistics.—The collection and tabulation of vital statistics are activities of the health department. Reporting of births is found by checks to be 97 per cent complete, while 100 per cent of the deaths are considered reported. The usual tabulations are made but not published.

Communicable-disease control.—The ratio of cases to deaths of typhoid fever (4.3), diphtheria (11.5), and whooping cough (17) is low as compared with minimum standards of 10, 15, and 25, respectively, suggested as an indication of reasonable completeness of reporting by the appraisal form of the Committee on Administrative Health Practice. A three-weeks' period of isolation for measles cases is longer than general experience seems to indicate as necessary. The proportion of communicable-disease cases hospitalized is unusually high, there being 98 per cent of the typhoid cases, 85 per cent each of the cases of diphtheria and scarlet fever, and 100 per cent of the cases of smallpox thus cared for.

Tuberculosis.—There were 1,230 cases of tuberculosis, with 656 deaths. One municipal clinic is maintained, there having been 3,227 clinic patients who made 6,049 visits during the year, while 8,212 visits were made to homes by eight nurses. There were 252 beds available for city cases, 631 patients having been admitted to the San Francisco Hospital.⁴¹

Venereal diseases.—Reporting in accordance with State and municipal law is by office number to the local health department, 1,052 cases of syphilis and 974 cases of gonorrhea having been reported. Clinic service is provided at the central building of the health department, where 1,671 cases of syphilis, 1,135 cases of gonorrhea, and 28 other cases received treatment, a total of 9,108 visits being recorded. One social-service worker does follow-up work. Clinic facilities are also available at four local hospitals, while one ward for women is maintained for bed cases.

Child hygiene.—All child-hygiene work is organized under the board of health. There were 540 expectant mothers registered at prenatal clinics during the year. Of 8,748 live births, 7 per cent were attended by midwives registered and supervised by the health department and 6 per cent occurred in hospitals. A total of 1,737 children under 2 years of age attended the 12 health department clinics, making a total of 7,174 visits, while 914 children made 3,876 visits to the children's health center. There were also 8,431 preschool children registered at clinics. In all, 3,953 nursing visits were made to homes of children of these age groups. Health supervision of children of the public and parochial schools is maintained by the health department, which employs 5 physicians (1 full time), 25 nurses full time, and 9 dentists part time for the 55,670 children of the public schools and the 12,000 enrolled in parochial schools. Each child in grade schools is given a complete physical examination on admission and periodically thereafter by the physicians, with follow-up

⁴¹A contract has been let for an additional 60-bed ward for children on the roof of the existing tuberculosis hospital and for the first unit of a tuberculosis preventorium 30 miles from the city.

work by nurses. There were 32,342 examinations made in 1923, with 10,774 defects found and 10,235 defects corrected. Children applying for working papers must pass a general physical examination given by the chief medical inspector of schools. The only mental hygiene work is done by the State through the university.⁴²

Industrial hygiene.—This work by the health department is limited to factory inspections of a general sanitary character.

Public-health nursing.—There were 42 nurses provided by the health department, and 10 nurses by voluntary agencies, giving a ratio of 9.7 nurses per 100,000 population.

Laboratory.—A public-health laboratory performs a wide range of bacteriological and chemical examinations for physicians, for clinics, and for inspectors engaged in the supervision of milk, food, and water supplies. A total of 97 diagnostic examinations per 1,000 population was made in 1923.

Food.—All the cows from which milk is sold in the city are tuberculin tested twice a year by State veterinarians. The dairy farms are inspected and scored every two months, while the 19 milk plants, in which 97 per cent of the supply was Pasteurized, are more frequently inspected. The per capita milk consumption was 0.75 pint daily, which is only three-fourths of the desired standard. Food-handling establishments are regularly inspected, permits are issued to milk dealers, and restaurants are scored.

Sanitation.—General sanitary inspections are made for the abatement of nuisances, to determine general sanitary conditions, as well as to insure rat proofing of buildings. Plumbing inspection is still under the health department.

Public utilities.—The public water supply used by 98 per cent of the population is privately owned and derived from surface sources. A pressure filter is used for the emergency well supply when used, while chlorination is routinely employed. Laboratory tests of treated water showed *B. coli* present in 1 per cent of the 10-cubic centimeter samples. The combined system of sewerage is employed and was accessible to 98 per cent of the population. The sewage is discharged without treatment into the bay.

Public-health education.—There is no special organization for this work, but the health officer has a yearly exhibit at the State industrial show, and delivers occasional lectures before community clubs and in schools.

Special comment.—Considerable progress has been made since 1920 in extending the child hygiene and tuberculosis programs. There is still need, however, for more prenatal clinic work,⁴³ and for an active campaign of public-health education, made possible by an increased budget for health purposes proper. Gaseous fumigation as a means of control of communicable diseases is rapidly being abandoned in most cities.

SAVANNAH, GA.

Savannah is a city of 89,448 people, of whom 49.1 per cent are native white, 3.8 per cent foreign born, and 47.1 per cent colored. There were 12,815 persons per square mile. The total taxable valuation amounted to \$819 per capita.

Administration.—The city is governed by a mayor and aldermen. There is a board of sanitary commissioners, consisting of seven members appointed for a term of two years by the mayor. The health officer is appointed by the city council, after a competitive examination, for a term of two years, at a salary

⁴² Child guidance and mental hygiene clinics have recently (1925) been organized under a psychologist and two assistants.

⁴³ In 1925 the city has been districted and generalized nursing has been instituted. Prenatal work has been increased, as has been the mental-hygiene program.

of \$4,800. The position is not under civil service. The appointments of the director of laboratories, of the supervisor of nurses, and of the chief food inspector are made on the basis of competitive examinations, and a hearing after charges have been preferred is necessary for their removal. The making of rules and regulations and the fixing of salaries are functions of the city council.

Expenditures.—The total expenditures by the health department in 1923 amounted to \$1 per capita, \$0.81 being for strictly health purposes, \$0.16 for mosquito control, and \$0.03 for activities not specified. In 1920 \$0.76 per capita was expended for health purposes.

Vital statistics.—Registration of vital statistics is conducted by a special registrar, reports of births, deaths, and communicable diseases being made to the health department. Certificates of both births and deaths are regularly checked for completeness and accuracy.

Communicable-disease control.—The number of cases for each death from typhoid is 7; for diphtheria, 10.2; for scarlet fever, 28; for measles, 30; and for whooping cough, 9. There are 34 beds per 100,000 population available for hospitalization of communicable diseases. Approximately all of the school children have been vaccinated against smallpox.

Tuberculosis.—There were 167 deaths from tuberculosis with only 102 cases reported, which suggests that cases of this important disease are not discovered early and promptly reported to the health department. The large proportion of colored persons in the city, among whom tuberculosis rates are unusually high, is doubtless an important factor in this regard. A total of 888 clinic patients is on active records as having made 2,122 visits to the clinic.

Venereal diseases.—Reporting is by office number to the health department, 1,260 cases of syphilis and 92 cases of gonorrhea having been reported during the year, while 1,951 cases of syphilis, 212 cases of gonorrhea, and 20 other cases were treated in the clinic operated by the health department.

Child hygiene.—Of the 2,052 live births, 31.6 per cent were attended by midwives who are supervised by the public-health nurses. A total of 1,889 pre-school children attended infant-welfare clinics during the year, while 2,791 nursing visits were made. There is evidently no health supervision of school children exercised in the city other than vaccination against smallpox. No special examination is required of children applying for working papers.

Public-health nursing.—Eight nurses were provided by the health department and 20 by voluntary agencies, giving a ratio of 31.3 nurses per 100,000 population.

Laboratories.—A well-organized public-health laboratory provides the usual bacteriological and chemical facilities for the community, 88 diagnostic examinations per 1,000 population having been made.

Food and sanitation.—Systematic supervision is exercised over the milk supply. All herds must be tuberculin tested annually. Approximately 5 per cent of the milk supply was Pasteurized. The per capita milk consumption amounted to 0.5 pint daily, which is only half the desired standard. Inspections are regularly made of food-handling establishments, and licenses are issued to grocery stores, restaurants, hotels, and soda fountains. General sanitary inspections are made, and include systematic house-to-house inspections on the initiative of the department, as well as efforts to abate nuisances after complaints have been received from the citizens.

Public utilities.—The public water supply, owned by the city, is derived from artesian wells and supplies all the people. None of the 1-cubic centi-

meter samples of the water examined in the laboratory showed *B. coli*. Both the combined and separate systems of sewerage are employed and served 85 per cent of the population, the sewage being discharged untreated into the Savannah River.

Public-health education.—The health officer publishes an annual report and monthly bulletins. The daily press is utilized and an annual health exhibit is prepared for the State fair. Lectures are given before civic organizations by members of the staff.

Special comment.—Efforts should be made to improve still further reporting of the principal communicable diseases and to secure increased hospitalization of cases. The antituberculosis program should be extended. There is an urgent need for the development of a modern school-hygiene program. Pasteurization of milk should be required and increased milk consumption stimulated.

SCHENECTADY, N. Y.

Schenectady is an industrial city of 98,773 people, the population per square mile being 9,650. The total taxable valuation was \$787 per capita.

Administration.—The city is governed by a mayor and council, with a health commissioner appointed by the mayor for a term of four years at a salary of \$3,500 on a part-time basis. The health commissioner has broad administrative powers, there being no advisory council nor board of health.

Expenditures.—The total expenditures of the health department in 1923 amounted to \$0.67 per capita, \$0.51 of which was devoted to health purposes proper, with \$0.06 set aside for hospitals, \$0.03 for plumbing inspection, \$0.03 for medical poor relief, and \$0.04 for miscellaneous items. In 1920 the total expenditures of the health department was \$0.58 per capita.

Vital statistics.—It is stated that the probable percentage of births recorded is 98 per cent, with 100 per cent of the deaths reported. Reports are received by the health department, and certificates of births and deaths are regularly checked and verified for completeness.

Communicable-disease control.—Measures for the control of communicable diseases correspond with accepted standards and are in accord with regulations of the sanitary code of the State of New York. There are 32 beds per 100,000 population for hospitalization of communicable diseases.

Tuberculosis.—There were 135 cases of tuberculosis reported with 46 deaths. During the year 685 clinic patients attended the clinic, having made 700 visits, while 2,676 visits by nurses were made to homes of tuberculosis cases. There are 112 beds available in the county sanatorium.

Venereal diseases.—Reporting, in accordance with State law, is by name and address to the health department, 170 cases of syphilis and 230 cases of gonorrhea having been reported. One clinic is maintained at the health center, where 98 cases of syphilis, 83 cases of gonorrhea, and 4 other cases were treated. A nurse makes home visits to locate cases which are not regular in their attendance at the clinic.

Child hygiene.—A prenatal clinic is conducted, where 193 cases were in attendance, having made 442 visits. Out of 1,735 live births, approximately 20 per cent were attended by midwives, who are supervised by the local and State health departments. Three infant-welfare clinics are conducted by the health department, and these were attended by 708 children under 2 years of age, while 6,923 nurses' visits were made to homes. Health supervision of children of the public schools is maintained by the board of education, while health supervision of children of the parochial schools is provided by the board of health. A complete physical examination is given annually to all grade school

children, but the records of defects corrected are not complete. There is no organized mental hygiene work carried on by the health department, except for the provision of a room for a clinic held monthly under State auspices. A physical examination is required of children applying for working papers.

Industrial hygiene.—The only work in this field is that of individual concerns.

Public-health nursing.—Ten nurses were provided by the health department, 16 by the board of health and 10 by voluntary agencies, giving a ratio of 36.5 nurses per 100,000 population.

Laboratory.—There were 67 examinations per 1,000 population made in the public health laboratory, in addition to 1,864 milk examinations and 164 water analyses.

Food and sanitation.—The dairies producing milk for the city are inspected once a year and scored. The State law requires that herds from which milk of certified or Grade A raw quality is sold shall be tuberculin tested. Fifty per cent of the milk supply was Pasteurized. The per capita milk consumption amounted to 0.6 pint daily, which is 0.4 less than the desired standard. Food inspections are made in routine. Sanitary inspections are made chiefly upon complaint of nuisances, while plumbing inspection is still considered a function of the health department.

Public utilities.—The public water supply, owned by the city, is derived in part from wells and in part from the Mohawk River, and is served to all the people after chlorination. The separate type of sewerage is employed and accommodated practically all the people. Treatment is by Imhoff tanks, and about 5 per cent of the sewage is passed through trickling filters, the effluent being discharged into the Mohawk River.

Public-health education.—The health department publishes an annual report of 250 copies. The press is utilized occasionally, and a health show is conducted every three years by the health department.

Special comment.—Schenectady has a well-organized health department for a city of its size, and is in a unique position to develop a particularly strong health program if increased funds are made available to allow for full-time medical health officer's service and for added personnel for the extension of activities already under way. Efforts should be made to stimulate early diagnosis and reporting of cases of tuberculosis. Continuous records of the physical examinations of school children should be maintained to show not only the defects found but the correction of these defects. Health education might well be extended.

SCRANTON, PA.

Scranton is an industrial city of 140,536 people, classified as 78.8 per cent native white, 20.8 per cent foreign born, and 0.4 per cent colored. The population per square mile was 6,988. The total taxable valuation amounted to \$1,028 per capita.

Administration.—The city is governed by a mayor and five councilmen. There is no board of health nor advisory council, the director of health being directly responsible to the mayor by whom he is appointed. The term of office is four years on a part-time basis at a salary of \$2,500 a year. Broad administrative powers are given the director of health.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.26 per capita, of which \$0.12 was expended for hospitals and \$0.02 for plumbing inspection. In 1920 the same total was expended by the health department, \$0.14 having been for hospital care. This is one of the lowest per-

capita expenditures for cities of this class and provides for only the rudiments of protection against communicable diseases.

Vital statistics.—The collection of vital statistics is carried on by a local registrar appointed by the State, who files copies of birth and death reports with the health department. It is estimated that 75 per cent of the births and approximately 100 per cent of the deaths are reported. A monthly record of the causes of death classified by age groups is maintained.

Communicable-disease control.—The ratio of reported cases of communicable disease to the number of annual deaths from the principal diseases is considerably lower than the standard suggested as an indication of complete reporting by the appraisal form of the Committee on Administrative Health Practice. There are 45 hospital beds per 100,000 population provided for cases of communicable disease, and 80 per cent of the cases of typhoid and 100 per cent of the cases of smallpox are thus cared for, but the proportion of diphtheria and scarlet-fever cases hospitalized is reported to be small. All the school children are reported to have been vaccinated against smallpox.

Tuberculosis.—There were 108 cases with 82 deaths reported. Clinic facilities are provided by the State. Visits by nurses in behalf of tuberculosis cases numbered 2,463 during the year, while 509 clinic patients were on active records (207 new patients), 3,480 clinic visits having been made. There were 74 hospital admissions to State sanatoria during the year.

Venereal diseases.—There were 188 cases of syphilis, 175 cases of gonorrhea, and 13 other cases reported. Clinic facilities are provided by the State, 12,486 treatments having been given. A special clinic is also maintained at one of the local hospitals.

Child hygiene.—Midwives are registered in accordance with State regulations. There were 300 expectant mothers registered with the visiting nurse association during the year. One infant-welfare clinic is operated by the State health department, where 215 babies were under care, having made 621 visits to clinic. Three baby-welfare clinics (district nurses' association) cared for 1,364 children up to 6 years of age in 1923, while 9,292 home visits were made by district nurses. Health supervision of children of public schools is carried on by the department of education. An attempt is made to give children of all grades a superficial physical examination once a year by a physician, in addition to a physical inspection once a year by a nurse. A total of 25,336 examinations was made and 21,635 defects discovered, while 9,983 defects were corrected. Children applying for working papers are required to pass a physical examination given by a private physician. A mental hygiene clinic is held at the local dispensary under the auspices of the State department of health.

Industrial hygiene.—Industrial hygiene service is provided by individual concerns.

Public-health nursing.—Two nurses were employed by the health department, 4 by the board of education, 5 by the State, and 24 by other agencies, giving a ratio of 25 nurses per 100,000 population.

Laboratory.—A public-health laboratory is maintained where 34 diagnostic examinations per 1,000 population were made, in addition to bacteriological and chemical examinations of milk and water.

Food and sanitation.—Dairies producing milk for the city are inspected and scored, 257 inspections having been made during the year. Ninety-eight per cent of the milk supply was Pasteurized, while tuberculin testing of herds from which certified milk is sold is required. The per capita milk consumption amounted to 0.9 pint daily. The ordinance permits only Pasteurized or certi-

fied milk to be sold in the city. Inspections of food-handling establishments are made regularly, and a physical examination is required of food handlers every six months. General sanitary inspections are made chiefly as the result of citizens' complaints for the abatement of nuisances, the sanitary inspectors also assisting in placarding of houses in which communicable-disease cases are present. Plumbing inspection is still considered a function of the health department.

Public utilities.—The public water supply, privately owned, is derived from tributaries of the Lackawanna River, and is treated by chlorination, about 10 per cent of the supply being filtered in addition. Practically all the population is served by the public supply. Both combined and separate systems of sewerage are employed and were accessible for 80 per cent of the population, the sewage being discharged untreated into the Lackawanna River. Scavengers are licensed by the health department.

Public-health education.—The health director publishes an annual report and utilizes the daily press for the publication of a weekly health letter. He also delivers occasional lectures on health subjects before civic clubs and parent-teacher organizations. A pamphlet, "Care of Baby," is mailed to each new mother (3,254 copies in 1923), in addition to other educational material distributed by nurses.

Special comment.—There is urgent need for an increased appropriation for health services to provide for a comprehensive program of disease prevention⁴⁴ and health promotion, including provision for full-time medical health-officer service. Adequately trained and suitably paid officials are also needed for the various departmental bureaus. An increased public-health nursing staff should be provided for the health department, and a child-hygiene program reaching from the prenatal period through school life should be developed.

SEATTLE, WASH.

Seattle is a city of 315,685 people, of whom 73 per cent were native white, 23 per cent foreign born, and 4 per cent colored. The city occupies an area of 68.5 square miles, giving a population per square mile of 4,609. The taxable valuation amounted to \$758 per capita.

Administration.—A mayor and council govern the city. There is no board of health nor advisory council. The commissioner of health is appointed by the mayor on a full-time basis for a five-year term at a salary of \$5,000. By law it is required that he must have practiced medicine for five years prior to his appointment. Broad administrative powers are given the health commissioner. The position is not under civil service, and the commissioner is subject to removal by the mayor, with the consent of council.

Expenditures.—The total expenditures by the health department in 1923 amounted to \$2.94 per capita, but of this \$0.87 was for hospitals and \$1.51 for garbage collection, with \$0.02 for plumbing and \$0.02 for rat eradication, leaving \$0.52 for health purposes proper. In 1920 the department of health expended \$3.18 per capita, \$0.63 of which was for health purposes, \$0.88 for hospitals, and \$1.66 for garbage and refuse service.

Vital statistics.—By State law the commissioner of health is registrar of vital statistics. Systematic checks of both birth and death certificates indicate that 97 per cent of the former and 99¼ per cent of the latter are reported. Reports are issued monthly.

⁴⁴ A diphtheria-immunization campaign has been undertaken and over 6,000 children (1925) have received the benefit of protective measures.

Communicable-disease control.—Reporting of the principal communicable diseases seems to be satisfactory, except for typhoid fever, there being an average of only 5.5 cases per death reported. Control practices for the most part correspond with accepted standards, although the number of hospital beds provided for communicable-disease cases (21 per 100,000 population) is slightly less than half the number usually needed for this purpose. Consulting diagnostic service is maintained and nearly all types of communicable disease are routinely visited by a physician of the health department. Gaseous fumigation is still practiced after cases of typhoid, diphtheria, scarlet fever, and smallpox. Before release of typhoid patients the health department properly requires two negative stool and urine cultures.

Tuberculosis.—There were 776 cases of tuberculosis with 194 deaths reported, a creditable record of reporting. A tuberculosis clinic is operated daily by the health department for diagnosis, consultation, and treatment. This clinic was attended by 2,224 patients who made 4,581 visits, while 4,575 nursing visits were made to homes of tuberculosis patients. In addition to facilities in two private sanatoria, there are available for city cases 146 beds for adults and 24 beds for children in the municipal sanatorium, to which 259 patients were admitted during the year.

Venereal disease.—There were 429 cases of syphilis, 911 of gonorrhea, and 21 other cases reported by office number to the health department. A venereal-disease clinic operated daily in the forenoon by the health department treated 806 cases of syphilis and 656 cases of gonorrhea. Thirty hospital beds are provided for venereal-disease cases.

Child hygiene.—One prenatal clinic is maintained by voluntary agencies, 118 cases having been registered. Midwives are licensed by the State after passing an examination. Of 5,388 live births, 3,233, or 60 per cent, occurred in hospitals. There were 1,181 children under 2 years of age who attended the seven infant-welfare clinics of the health department, having made 6,081 visits; nursing visits to homes numbered 13,478. Health supervision of children of the public schools is carried on by the board of education, school inspection in parochial schools being limited to communicable-disease work by the health department. All children of the grade and high schools are physically examined on admission and periodically thereafter, but examination of heart and lungs is limited to children participating in athletics. There were 47,772 examinations made and 26,225 defects discovered, while 572 defects were corrected in clinics and 12,703 by private physicians and dentists during the year. Children applying for working papers must pass a physical examination made by the school-attendance officer before being issued a certificate. No special work is done for the promotion of mental health.

Industrial hygiene.—There is no activity in this field by official agencies.

Public-health nursing.—Sixteen nurses were provided by the board of education, 17 by the health department, while 11 nurses are employed by voluntary agencies, giving a ratio of 13.9 nurses per 100,000 population.

Laboratory.—A public-health laboratory is maintained for the examination of milk, water, and diagnostic specimens. A total of 175 diagnostic examinations per 1,000 population was made.

Food.—There were made 3,055 inspections of the 500 producing dairies, which were scored on the United States Department of Agriculture score card, the minimum score allowed being 70. Approximately 40 per cent of the dairy cows have been tuberculin tested, while 85 per cent of the milk supply was Pasteurized. The per capita daily milk consumption was 0.7 pint, or 30 per cent below the desired standard. Inspections are made of packing houses, of

foodstuffs received from other States, and of food-handling establishments. A complete physical examination is required, made annually, of all food handlers, 5,583 such examinations having been made in 1923.

Sanitation.—Sanitary inspections are made chiefly as a result of complaint for the abatement of nuisances. Plumbing inspection and garbage and refuse collection are carried on by the health department. A contractor collects the portion of garbage suitable for hog feeding, while the remainder, together with ashes, is collected by the health department and dumped on land to be reclaimed for building purposes, this material being promptly covered. Fly-proof receptacles are required for the storage of stable manure. Special measures are directed against rat eradication by trapping, poisoning, and the rat proofing of old and new buildings.

Public utilities.—The public water supply, owned by the city, is derived from Cedar River, and is chlorinated before being served to 98 per cent of the population. Laboratory examinations of treated water showed *B. coli* present in 11.4 per cent of the 10-cubic-centimeter samples. The combined system of sewerage is employed and was accessible to 96 per cent of the population. The sewage is discharged untreated into the bay. There were 2,800 privy vaults in use in outlying districts.

Public-health education.—Aside from the publication of an annual report of 350 copies, of a monthly bulletin of 4,000 copies, and various pamphlets there was in 1923 no organized attempt to educate the public in health affairs, but a more active program has been developed since that time.

Spical comment.—Prenatal work has been undertaken to a small degree since 1920 for the purpose of teaching mothers the value of supervision during pregnancy. Reporting of communicable diseases, including tuberculosis, is creditable. There is still needed an increased number of nurses for communicable-disease and infant-welfare clinic work. Gaseous fumigation as a measure of communicable-disease control should be abandoned. The program of public-health education should be extended.

SIOUX CITY, IOWA

The population of Sioux City was 79,662, classified as 82.7 per cent native white, 15.7 per cent foreign born, and 1.6 per cent colored. The population per square mile was stated to be 1,777. The total taxable valuation was \$468 per capita.

Administration.—The city is governed by five commissioners, one of whom is the mayor. The city commissioners serve as the board of health. The health commissioner is appointed by the city commissioners for a term of two years at a salary of \$3,500. The position is not under civil service. It is specified that the health officer must have training in sanitation and hygiene, but it is not required that he be a graduate in medicine.

Expenditure.—The total health department expenditures in 1923 amounted to \$0.16 per capita, all for health services proper. This is one of the lowest health department appropriations of the cities studied.

Vital statistics.—Registration of vital statistics is conducted by the State board of health. The probable percentage of births reported is not known, although 100 per cent of the deaths are considered reported.

Communicable-disease control.—Reporting of the principal communicable diseases is fairly complete. Typhoid cases are held for 42 days and released without bacteriological examination of stools and urine. Gaseous fumigation is still practiced after practically all cases of communicable disease. Ninety per

cent of the school children have been vaccinated against smallpox. There are 38 beds per 100,000 population for communicable-disease cases.

Tuberculosis.—There were 50 cases of tuberculosis reported, with 20 deaths. Clinic facilities are made available by the county medical society. Hospitalization is provided in the State sanatorium and also in an adjoining county institution.

Venereal disease.—Reporting, in accordance with State law, is by office number to the health department, but information as to number of cases thus reported is not available in the local health department office. There were 203 cases of syphilis and 155 cases of gonorrhea treated in clinics during the year.

Child hygiene.—Three prenatal clinics are conducted by the visiting nurse association. There is no information concerning midwives, inasmuch as their practice is not recognized in the State. One infant-welfare clinic is conducted by the visiting nurse association. Health supervision of children of the public schools is carried on by a staff of nurses and one dental hygienist. This includes an inspection of children of all grades once every two years. Children applying for working papers are required to pass a physical examination made by the city attendance officer. There are no special activities for the promotion of mental hygiene, and no official industrial hygiene work.

Public-health nursing.—Four nurses were employed by the board of education and seven by the visiting nurse association, giving a total of 13.9 nurses per 100,000 population.⁴⁵

Laboratory.—A total of 7,813 laboratory examinations was made in the public-health laboratory during the year. This laboratory is a branch of the State laboratory, the health commissioner being assistant State bacteriologist.

Food and sanitation.—Inspections are made at irregular intervals of dairies and milk plants, which are also scored. Tuberculin testing of 90 per cent of the cattle producing milk for the city has been carried out, while 90 per cent of the milk supply was Pasteurized. The total per capita consumption amounted to 0.7 pint daily, which is 0.3 pint below the desired standard. Inspections are made of food-handling establishments,⁴⁶ and general sanitary inspections are made chiefly as the result of complaints for the abatement of nuisances.

Public utilities.—The public water supply, owned by the city, is derived from wells and was supplied to 75 per cent of the population. It is stated that laboratory analyses failed to show *B. coli* present in any of the samples examined. Both combined and separate sewerage systems are employed, and were used by 85 per cent of the population, the sewage being discharged untreated into the Missouri River.

Public-health education.—The health commissioner utilizes the daily press for stories concerning the value of toxin-antitoxin in the prevention of diphtheria and for other special health topics, while frequent lectures are delivered. Exhibits have been prepared illustrating subjects pertaining to communicable diseases, sanitation, and milk supervision.

Special comment. The health appropriations for Sioux City should be materially increased to make possible the development of a more modern health program. Apparently a start in the right direction has been made by securing a health officer with special training to work on a full-time basis. Measures for the control of communicable disease should be made to confirm more nearly

⁴⁵ In 1926 one health department nurse devotes full time to work in private and parochial schools.

⁴⁶ A full-time veterinarian now (1926) acts as meat inspector at slaughterhouses.

to the standards of the American Public Health Association. There should also be developed measures for the protection of maternity and infancy, and health supervision should be provided for children of the parochial schools, while all school children should be given a complete physical examination by physicians at least three times during their school career, with efforts made to secure correction of defects found.

SOMERVILLE, MASS.

Somerville is a residential city of 98,807 people, classified as 73.7 per cent native white, 26 per cent foreign born, and 0.3 per cent colored. The population per square mile was 23,460. The total taxable valuation was \$936 per capita.

Administration.—The city is governed by a mayor and board of aldermen. There is a board of health of three members appointed by the mayor for terms of two years each. The health officer, who serves as medical inspector and bacteriologist, is appointed by the board on a part-time basis at a salary of \$2,750. The duty of the board includes the appointment and dismissal of subordinates, the fixing of salaries, the making of rules and regulations, the hearing of appeals from orders, and the abatement of insanitary conditions (through the agent or health officer).

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.51 per capita, \$0.18 being for hospitals. This compares with \$0.57 per capita spent in 1920, \$0.32 being for hospital service.

Vital statistics.—Registration of vital statistics is carried on by the city clerk, who makes a house-to-house canvass yearly as a check on the number of births. It is stated that 95 per cent of the births and 100 per cent of the deaths are reported. Death certificates from communicable diseases are routinely checked against disease reports, and deaths under 1 year and stillbirths are checked against births and stillbirths.

Communicable-disease control.—Reporting of communicable diseases is shown to be reasonably complete as judged by the ratio of cases to annual deaths. Control measures in general conform to accepted standards, although cases of typhoid are released from isolation without first securing negative cultures, except in special cases. Seventy-five per cent of the cases of typhoid, 60 per cent of the cases of diphtheria, 30 per cent of the cases of scarlet fever, and all cases of smallpox are hospitalized. Ninety-nine per cent of the school children have been vaccinated against smallpox.

Tuberculosis.—There were 131 cases with 54 deaths reported to a daily clinic operated at the hospital, while the Boston clinics are also utilized. Nurses' visits in behalf of tuberculosis cases numbered 743 for the year.

Venereal diseases.—There were 21 cases of syphilis and 58 cases of gonorrhea reported. There is no local venereal-disease clinic service. Patients are either attended by private physicians or go to the clinics in Boston or other cities.

Child hygiene.—There were 1,921 live births during the year. A total of 618 infants under 2 years of age was under supervision, while 6,000 visits to clinics were made in addition to 8,634 nurses' visits to homes. Health supervision of children of the public and parochial schools is carried on by the board of health. A physical examination is given children of all grades below the senior high school once a year. Children applying for working papers are required to pass a physical examination given by any physician.

Industrial hygiene.—There is no official work in this field except that carried on by the State department of labor and industry.

Public-health nursing.—Five nurses were employed by the health department, 2 by the board of education, and 4 by the visiting nurse association, giving a ratio of 11.1 nurses per 100,000 population.

Laboratory.—A total of 5,549 examinations was made in the local laboratory, 4,456 being bacteriological and chemical examinations of milk, 1,000 examinations for diphtheria, 135 for tuberculosis, 47 for typhoid fever, and 9 for ophthalmia neonatorum.

Food and sanitation.—Over 99 per cent of the entire milk supply was of Pasteurized grade, inspections of milk plants being regularly made by State inspectors and occasionally by city inspectors. Inspections are regularly made of foodstuffs and of methods of handling foods. General sanitary inspections are made both on the initiative of the department and as a result of citizens' complaints. Garbage is taken by farmers from collection platforms and is disposed of by feeding to hogs. Active measures are directed against fly breeding by special supervision of manure pits and regulations for prompt removal of stable manure.

Public utilities.—The public water supply is that of the Metropolitan District, which is treated by storage before being served to all of the people. Both separate and combined systems of sewerage are employed and were accessible for practically 100 per cent of the population.

Public-health education.—An annual report of 200 copies is published. Occasional lectures are given before the organizations by members of the health department staff.

Special comment.—There is need for an increase in the budget of the health department for health purposes proper to provide for a comprehensive program for the control of tuberculosis and the venereal diseases, and for the protection of maternity and infancy reaching through the school period.

SOUTH BEND, IND.

South Bend is a city of 76,859 people, 56.2 per cent of whom were native white, 40 per cent foreign born, and 3.8 per cent colored. The city occupies an area of 16 square miles, giving an average population of 4,804 per square mile. The total taxable valuation amounted to \$1,968 per capita. The city is governed by a mayor and council.

Health department.—A paid board of health and charities of three members is appointed by the mayor to serve during his term of office, usually for four years. Health regulations prepared by the board are subject to the approval of the common council. The health officer is appointed by the board on a part-time basis for a four-year term at a salary of \$1,500 a year. His staff consists of a clerk, a nurse for parochial-school work, a milk and food inspector, an assistant food inspector, a plumbing inspector, and two sanitary policemen loaned and paid by the police department. The per capita expenditure in 1923 amounted to \$0.33, of which \$0.03 was for plumbing inspection.

Registration of vital statistics is conducted by the health department, but checks are not made of completeness. Reporting of the important communicable diseases is only partially complete as judged by the ratio of the number of cases in relation to annual deaths, and there is no special epidemiological investigation carried out except in typhoid epidemics. No provision is made for the hospitalization of cases of diphtheria and scarlet fever and no anti-tuberculosis work is carried on by the health department, this work being handled by the St. Joseph Antituberculosis League, which registered 1,471 patients during the year. Activities for the control of venereal diseases center around a clinic maintained jointly by the State and the United States

Public Health Service. Inspection of children of the parochial schools by a nurse has recently been introduced. A limited number of bacteriological and chemical examinations are performed in a private laboratory on a contract basis. For the year 1923 these examinations numbered 6,264. Dairy farms are inspected once a year, but there are no regulations concerning the tuberculin testing of cattle or Pasteurization. It was stated that 97 per cent of the supply was Pasteurized. The per capita milk consumption averaged 1 pint daily. Inspections of food establishments are made from time to time, but no licenses for their maintenance are issued, and no scoring is done. Plumbing is still considered a function of the health department, while general sanitary inspections are made as a result of complaints by two sanitary policemen.

Public utilities.—The public water supply, owned by the city, is derived from driven wells and served 90 per cent of the population. No gas formers were found in the samples examined in 1923. Ten per cent of the population use private wells. The combined sewerage system is employed and accommodated 70 per cent of the population, while 358 surface privies and 170 cess-pools were in use in districts not supplied by sewers.

Board of education.—Eight nurses were engaged in the health supervision of children of the public schools, making systematic inspections of the children and encouraging the correction of defects.

Infant welfare.—This work is performed by two agencies, the children's dispensary and hospital association, employing 3 nurses, and the visiting nurses' association, employing 8 nurses, the equivalent of 4 nurses' time being spent on infant-welfare work. A total of 154 visits to clinics was made by prenatal cases, while 3,124 visits of children under two years of age were made to clinics. In all, 8,167 nurses' visits were made in behalf of infants. Of 2,240 live births, 600 were attended by midwives, who are not regularly supervised.

Special comment.—The staff of the health department is engaged primarily in activities of environmental sanitation. The appropriation should be increased to allow for full-time health officer service and for additional staff to engage in child hygiene and public-health nursing. Measures for communicable-disease control should conform to standards accepted by the American Public Health Association, and an active campaign of public-health education should be instituted.

SPOKANE, WASH.

The population of Spokane was 104,573, classified as 80.6 per cent native white, 16.4 per cent foreign born, and 3 per cent colored. The city occupies an area of 39.2 square miles, giving a population per square mile of 2,660. The total taxable valuation was \$799 per capita.

Administration.—The city is governed by a commission. The board of health is composed of five city commissioners and the health officer. The health officer is appointed by the board of health on a full-time basis for a period of one year at a salary of \$3,600. The position is not under civil service. It is required that the health officer be a physician. The appointment and dismissal of subordinates is under civil-service regulations, while salaries are fixed by the city council.

Expenditures.—The total expenditures of the department in 1923 amounted to \$0.64 per capita, of which \$0.40 was devoted to health purposes proper and \$0.24 to hospitals. These compare with \$0.41 and \$0.24, respectively, in 1920.

Vital statistics.—The collection of vital statistics is conducted by the health department. Both birth and death certificates are checked and verified, with the result that 99 per cent of the births and 100 per cent of the deaths are

considered reported. Monthly reports are issued to newspapers and a printed report is published annually for general distribution.

Communicable-disease control.—Reporting of cases of typhoid is apparently not complete, as shown by the fact that only 3.5 cases are reported per death. But reporting of the other principal communicable diseases is quite satisfactory. The percentage of cases hospitalized is larger than the average for cities of this size. Approximately 60 per cent of the school children have been vaccinated against smallpox.

Tuberculosis.—There were 114 cases of tuberculosis, with 55 deaths reported. This low ratio of cases to deaths is an indication of incompleteness of reporting of this important disease. There are no clinic facilities provided by the municipality for early diagnosis and treatment of ambulant cases. There are 144 beds available for hospital cases, and 143 patients were admitted during the year. No special provision is made for the visitation of tuberculosis cases in their homes.

Venereal diseases.—Reporting of cases in accordance with State and municipal regulations is by office number to the local health department. There were 233 cases of syphilis and 500 cases of gonorrhea reported during the year. Clinic facilities are provided by the municipality and six sessions are held weekly. A total of 12,928 visits for diagnosis and treatment was made, while 99 persons were treated in the city hospital.

Child hygiene.—There is no special municipal organization for the safeguarding of maternity and infancy, prenatal and infant-welfare services being provided by the social service bureau, while school health supervision is carried on by the board of education. A prenatal clinic was organized in October, 1925. There were 937 children under 2 years of age who visited the infant-welfare clinic operated in the city hall by the social-service bureau. The staff of this clinic consists of a part-time physician and two part-time nurses. Physical inspections of all children in the grades of the public schools are made once a year by nurses of the board of education. Parents are notified of the findings and home visits are made by the nurses, if considered necessary, to urge treatment. Children applying for working papers are not required to pass a physical examination. There are no special activities for the promotion of mental health.

Industrial hygiene.—There is no special work in industrial hygiene carried on by the health department.

Public-health nursing.—Two nurses were employed by the health department and five nurses by the board of education, giving a ratio of 6.7⁴⁷ nurses per 100,000 population.

Laboratory.—There were 2,458 bacteriological and chemical examinations of milk, 107 analyses of water, 3,487 examinations of diphtheria cultures, and 24 miscellaneous examinations made in the public-health laboratory.

Food.—Dairies producing milk for the city are inspected but not scored. Tuberculin testing of herds from which raw milk is to be sold is required. Pasteurization is not compulsory, but 85 per cent of the supply was thus treated. The per capita milk consumption amounted to 0.53 pint daily. Inspections are regularly made of food-handling establishments, and licenses are issued to bakeries and restaurants. Physical examination of food handlers is required, 7,389 such examinations having been made.

Sanitation.—General sanitary inspections are made upon the initiative of the department as well as in the follow-up of citizens' complaints. Special meas-

⁴⁷ Exclusive of three nurses employed by voluntary organizations.

ures directed against flies include the regulation that fly-proof bins be used for storing stable manure.

Public utilities.—All the people are served by the public water supply, owned by the city, which is derived from wells and is untreated. Laboratory analyses of water are made once a week in the city laboratory, and it is reported that none of the 10-cubic centimeter samples showed *B. coli* present. The public sewerage system is of the combined type, the sewage being discharged untreated into the Spokane River, and 65 per cent of the dwellings are connected with the city sewer. There were 3,000 privy vaults and 6,500 cesspools in use in outlying districts of the city. Special regulations of the health department as to their maintenance are in force.

Public-health education.—There is no organized attempt for public-health education in the city. The daily press is utilized and lectures are delivered from time to time by the health officer on general health topics.

Special comment.—There is need for provision of clinic service for early diagnosis of tuberculosis and for a comprehensive program for the promotion of child health, reaching from the prenatal period through school life. Provision should be made for a complete physical examination of children in the public and parochial schools at least three times during their school career. Increased appropriations for the development of more extensive health activities by the health department are needed.

SPRINGFIELD, MASS.

Springfield is an industrial city with a population of 144,247, classified as 73 per cent native white, 25 per cent foreign born, and 2 per cent colored. The population per square mile was 3,888. The total taxable valuation was \$1,730 per capita.

Administration.—The city is governed by a mayor, council, and board of aldermen. The board of health of three members is elected by the city council for terms of three years each. The agent of the board is appointed for an indefinite term on a full-time basis at a salary of \$2,800 a year.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.88 per capita, \$0.37 being for hospitals. In 1920, \$0.85 per capita was expended, of which \$0.44 was for health purposes proper.

Vital statistics.—The registration of vital statistics is a function of the city clerk, who submits copies of reports to the health department and makes checks for completeness and accuracy of reporting, in addition to checks made by the health department. Analyses of vital statistics data are made by the health department, which publishes an annual report including this material.

Communicable-disease control.—Measures for the control of communicable disease correspond in general with accepted standards. Twenty-five per cent of the cases of typhoid, 38 per cent of the cases of diphtheria, 30 per cent of the cases of scarlet fever, and all the cases of smallpox are hospitalized. Over 95 per cent of the school children have been vaccinated against smallpox.

Tuberculosis.—There were 193 cases of tuberculosis, with 73 deaths reported. Nurses' visits in behalf of tuberculosis cases numbered 2,196, while clinic patients numbered 479. A total of 35 beds is available in the health department hospital. In 1923, 90 patients were admitted to State sanatoria from Springfield.

Venereal diseases.—There were 86 cases of syphilis and 193 cases of gonorrhea reported, while 2,885 visits were made to the venereal-disease clinic under the control of the State department of health.

Child hygiene.—Prenatal work is carried on by the visiting nurse association (3,558 visits to homes). There are nine infant-welfare stations conducted

by the visiting nurse association. Nurses' visits in behalf of infants and preschool children numbered 34,724, while 7,798 children made a total of 10,521 visits to clinics. Health supervision of children of the public and parochial schools is carried on by the board of health, there being an average of one physician for 1,600 pupils and one nurse for 1,000 pupils. A complete physical examination is given each child once a year. There were 16,500 examinations made in 1923 and 15,766 defects discovered. A program of physical training and health education is carried out by the board of education. Children applying for working papers are required to pass a physical examination given by any physician.

Industrial hygiene.—This work is carried on by individual concerns, in addition to the activities of the State department of labor and industry.

Public-health nursing.—Ten nurses were employed by the board of health and 18 by the visiting nurse association, giving a ratio of 19.3 nurses per 100,000 population.

Laboratory.—A total of 4,069 laboratory examinations was made during the year, consisting of 2,306 milk analyses, 31 examinations for typhoid, 227 examinations for tuberculosis, and 1,505 examinations for diphtheria.

Food and sanitation.—There were 1,487 producing dairies for the city, which are inspected at intervals and scored. Approximately 89 per cent of the cows from which milk is sold to the city have been tuberculin tested, and 85 per cent of the milk supply was Pasteurized. The per capita milk consumption amounted to 1 pint daily. Inspections are regularly made of food stores, including meat markets and fruit stands. General sanitary inspections are made in routine, on the initiative of the department, and as a result of citizens' complaints.

Public utilities.—The public water supply, owned by the city, is derived from the Westfield River, and is treated by storage, chemical precipitation, sedimentation, and filtration before being served to 98 per cent of the population. Laboratory analyses are made regularly every day at the plant and monthly by the State department of health. Both the combined and separate systems of sewerage are employed and were accessible for approximately 90 per cent of the people, the sewage being discharged untreated into the Connecticut River.

Public-health education.—An annual report of 850 copies is published. The agent of the board of health utilizes the press weekly and delivers frequent lectures. Health exhibits covering various health subjects have been prepared.

Special comment.—There is need for increased health appropriations to provide for increased nursing staff and for the extension of the prenatal and infant-welfare program to include the preschool child. Pasteurization of all milk not from tuberculin-tested herds should be required. A health-education program should be developed as soon as funds and personnel will permit.

SYRACUSE, N. Y.

Syracuse was credited with 184,511 people, of whom 80.3 per cent were native white, 19 per cent foreign born, and 0.7 per cent colored. The city occupies an area of 19.3 square miles, giving a population per square mile of 9,560. The taxable valuation amounted to \$1,156 per capita.

Administration.—The city is governed by a mayor and common council. The department of public health is organized under a commissioner, with separate bureaus for the principal functional activities. An advisory council of five members, chosen from a list of 15 physicians submitted by the Syracuse Academy of Medicine, is appointed by the mayor to serve during his term of office.

The commissioner of health is appointed by the mayor to serve for a term of four years. His office is not under civil service. It is required that he be a licensed physician and surgeon of five years' experience in the practice of medicine or public health. He is subject to removal by the mayor. The commissioner of health is responsible for the appointment and dismissal of subordinates, for making rules and regulations, for issuing orders, including the promulgation of special emergency regulations, and for the abatement of insanitary conditions. The fixing of salaries rests with the board of estimates and apportionment.

Expenditures.—The total expenditures for the year 1923 amounted to \$0.96 per capita, including \$0.28 for hospitals, \$0.08 for medical poor relief, and \$0.02 for plumbing inspection. In addition to city appropriations a sum is appropriated by the Milbank Memorial Fund for health work. In 1920 there were expended \$0.93 per capita for health purposes.

Vital statistics.—The collection of vital statistics is conducted by the health department, and registration of births and deaths is reasonably complete, meeting the requirements of the State of New York and of the United States Government. Classification of births and deaths is made by cause, age, sex, and nativity, and monthly and annual tabulations are made. Verification by checking deaths from communicable diseases with case reports, and deaths under 1 year of age with birth reports, is carried out.

Communicable-disease control.—Reporting of communicable diseases is satisfactory. Well-constructed epidemiological case cards are used for keeping records of the more important diseases, and chronological charts are made for diphtheria and scarlet fever. Control practices correspond with modern standards. A diagnostic service for physicians in doubt as to the diagnosis of communicable diseases is maintained. During the year 10,044 Schick tests were made and 5,642 children were immunized. Vaccination against smallpox of all public-school children is required before admission to school. The city maintains a communicable-disease hospital of more than 100 beds, and is hospitalizing 40 per cent of its cases of typhoid fever, 50 per cent each of its cases of diphtheria and scarlet fever, and 100 per cent of its cases of smallpox.

Tuberculosis.—There were reported 318 cases of tuberculosis with 100 deaths. Nursing visits in behalf of tuberculosis cases numbered 3,393, or about 848 visits per nurse. Six clinic sessions are held each week, including one evening and one Sunday session, and a children's clinic. There were 894 patients who paid 1,707 clinic visits. At the county sanatorium 148 beds are available and 134 patients from Syracuse were admitted in 1923. There were 200 children enrolled in open-air classes, while 100 children averaged three months' stay in preventoria.

Venereal diseases.—The sanitary code requires reports to be made by laboratories to the local and State health departments by name and address of the cases. A total of 1,198 new cases of syphilis and gonorrhea was recorded, while 2,189 patients with syphilis and 1,173 with gonorrhea were treated in the clinic maintained by the health department. Nursing and social service follow up of cases is provided. Eighty-four cases were forcibly isolated and treated.

Child hygiene.—Nurses' visits to prenatal cases amounted to 1,172 per 1,000 births, while 826 prenatal cases, or 197 per 1,000 births, were registered at clinics. Of the 4,199 live births, 54 per cent occurred in hospitals, while 6.6 per cent were attended by midwives, who are registered and instructed to a limited extent. Four infant-welfare clinics are maintained by the health department and five by private agencies. There were 3,133 visits of infants and preschool children to these clinics, while 4,537 visits to infants under 2 years

of age were made by nurses. Children of the parochial schools are supervised by the staff of the health department, while those of the public schools are supervised by the staff of the department of public instruction. All children are weighed once a year. In 1923, 75,252 examinations were made of the 26,875 public-school children and 42,342 examinations were made of the 7,213 parochial-school children. Of 9,704 defects found among children of the public schools, 5,325 were reported corrected.

Mental hygiene.—A neuropsychiatric clinic is maintained by the State in cooperation with Syracuse University. The city health department also has a psychopathic detention hospital, where 241 patients were cared for during the year.

Industrial hygiene.—Factory inspection is carried on by the State department of labor. Industrial diseases are reportable under the State labor law to the industrial commission.

Public-health nursing.—There were 11 nurses provided by the health department, 12 by the board of education, 4 by the child-health committee, 15 by the visiting-nurse association, and 11 by other voluntary agencies, giving a ratio of 28.7 nurses per 100,000 population working on the specialized plan of nursing.

Laboratory.—The usual free bacteriological service is provided, a total of 170 diagnostic examinations per 1,000 population having been made in 1923.

Food.—Dairy farms are inspected and scored annually by a veterinarian of the health department. In accordance with the sanitary code, all cows producing milk to be sold as certified or Grade A raw must be tuberculin tested. The Pasteurization process is supervised, and 70 per cent of the supply was thus treated. The average per capita milk consumption was 0.7 pint daily. Inspections are regularly made of eating places, soda fountains, and bakeries. There were 1,671 inspections of food-handling places.

Sanitation.—General sanitary inspections are made as a result of complaints for the abatement of nuisances. No special measures are directed against the breeding of flies, mosquitoes, or rodents. A total of 2,220 sanitary inspections was made.

Public utilities.—The per cent of the population served by the public water supply is 99.5. The public supply, owned by the city, is obtained from the lake and is treated by chlorination. None of the 10-cubic centimeter samples of treated water showed *B. coli* present. Ninety-nine per cent of the homes in the city were sewered. Both the separate and combined systems of sewerage are employed, and a contract has been let for the installation of a treatment plant, the sewage at present being discharged untreated into Onandaga Lake.

Public-health education.—This work at present is conducted by a special director working under the Milbank Memorial Fund. A weekly bulletin and a bimonthly magazine are published and the daily press is utilized. Paid advertising has been used to some extent. Special exhibits, posters, poster contests, moving pictures, health plays, and health booklets are featured. A special department in the public library has been developed for books and periodicals on health subjects.

Special comment.—Considerable progress has been made in Syracuse since 1920 in securing, through official and voluntary agencies, increased appropriations for health purposes, in providing for more extensive care for mothers and infants, in securing increased nursing staffs, and in developing a program of health education. The health demonstration now in progress should prove of immense value not alone to this city but to other communities in showing what may be done, under favorable conditions, in health promotion.

TACOMA, WASH.

Tacoma is a city of 101,731 people, classified as 80 per cent native white, 15 per cent foreign born, and 5 per cent colored. The total taxable valuation amounted to \$589 per capita.

Administration.—The city is governed by a commission, the mayor being commissioner of health and sanitation. One medical health officer is appointed on a part-time basis by the mayor for a term of four years at a salary of \$3,000. The powers of appointment and dismissal of subordinates and of fixing salaries rest with the commissioner of health and sanitation.

Expenditures.—The total expenditure by the health department in 1923 amounted to \$0.46 per capita, including \$0.14 for hospitals, \$0.02 for watershed patrol, and \$0.04 for plumbing. In 1920, \$0.66 per capita was spent by the health department, \$0.52 being for health purposes and \$0.14 for hospital services.

Vital statistics.—The collection of vital statistics is conducted by the health department. Both birth and death certificates are checked and certified, and classified monthly reports are issued.

Communicable-disease control.—Typhoid cases are released after two negative cultures have been obtained from feces and urine specimens. The ratio of reported cases to deaths is somewhat lower than the standard for typhoid and diphtheria, but is reasonably complete for the other communicable diseases. Seventy per cent of the school children have been vaccinated against smallpox. The use of the Schick test and immunization measures against diphtheria has recently been undertaken. One communicable-disease hospital with 60 beds is available, and a total of 249 cases of all kinds were admitted during the year.

Tuberculosis.—There were 74 cases of tuberculosis reported with 41 deaths. There are no clinic facilities provided by the health department, although one clinic is maintained by the local public-health association, 105 patients having been cared for during the year. There were 1,959 visits made to homes of tuberculous patients. A total of 163 patients was admitted to the county sanitarium, which has 93 beds available for adult cases and 22 beds for children.

Venereal diseases.—Reporting of venereal diseases in accordance with State and municipal regulations is by office number to the local health department. Fifty-five cases of syphilis and 127 of gonorrhea were reported. One free clinic is operated by the health department in the city hall.

Child hygiene.—The public-health nursing association instructs expectant mothers in their homes. There were 2,226 live births, 5.5 per cent of which were attended by midwives, who receive no special supervision. Health supervision of the school children of the public schools is carried on by the board of education under a full-time medical director, assisted by five nurses and one dentist. A medical examination is given children who are referred by nurses to the physicians, but routine examinations of heart and lungs are not made. Children applying for working papers are issued a permit by the judge of the superior court without physical examination.

Industrial hygiene.—There are no special activities in this field.

Public-health nursing.—Five nurses were employed by the department of education and seven nurses by the local public-health association, giving a ratio of 12 nurses per 100,000 population.

Laboratory.—A total of 4,744 examinations was made in the public-health laboratory, 2,409 being examinations for diphtheria, 641 for gonorrhea, 119

for syphilis, 126 for tuberculosis, while 1,177 were milk examinations, in addition to other miscellaneous analyses.

Food and sanitation.—The 140 producing dairies were inspected an average of four times each during the year. The city and State regulations require that dairy herds be tuberculin tested once a year, and it is stated that approximately 65 per cent of the cows have been thus tested. There are five milk plants in the city in which 56 per cent of the supply was Pasteurized. The per capita milk consumption amounted to 0.7 pint daily. All food-handling establishments are inspected at intervals, and a physical examination is required made once a year of food handlers. Sanitary inspections are made as a result of citizens' or inspectors' complaints for the abatement of nuisances. Plumbing inspection is handled by the health department, which also exercises supervision over the collection and disposal of garbage on a contract basis.

Public utilities.—The water supply, owned by the city of Tacoma, is derived from Green River, and is treated by chlorination before being supplied to 90 per cent of the population. Four per cent of the 10-cubic-centimeter samples of treated water showed *B. coli* present. Both separate and combined types of sewerage are employed and accommodated 80 per cent of the population.

Public-health education.—The health officer utilizes the press for weekly statements concerning disease prevention, hygiene, and sanitation, and gives occasional lectures on health topics.

Special comment.—Bacteriological control for the release of typhoid-fever patients has been instituted since 1920. The health-department budget should be increased to provide for full-time medical health service, secure in tenure, and for an extension of prenatal and infant-hygiene work. Children of all schools should be given the benefit of a complete physical examination, including heart and lungs, at least three times during their school career. Health education might well be undertaken as an important function of the health department, provided funds can be secured for this purpose.

TOLEDO, OHIO

Toledo is an industrial city of 268,338 population, classified as follows: Native white 82 per cent, foreign born 15.7 per cent, and colored 2.3 per cent. The city covers an area of 31.9 square miles, giving a population per acre of 8,412. A total taxable valuation of \$1,748 was reported.

Administration.—The city is governed by a mayor and common council. There is no board of health nor advisory council. The health officer is appointed by and is responsible to the director of public welfare. His salary as a part-time executive is \$2,100, and his term of office rests with the welfare director, who is responsible to the council.

Expenditures.—The total expenditure of the health department in 1922 was \$0.59 per capita, including \$0.22 for hospitals; as compared with a total of \$0.62 in 1920.

Vital statistics.—Registration is conducted by a registrar in the health department, and checks of data indicate that approximately 95 per cent of births and 100 per cent of deaths are reported. Deaths are classified by age and sex but not by nativity, and an annual report is published.

Control of communicable diseases.—Notification is above the standard set by the Committee on Municipal Health Department Practice for scarlet fever, measles, and whooping cough, but is low for typhoid and diphtheria, which call for 10 and 15 cases per death annually. Cases of typhoid are released after a period of 42 days without culture, but two negative cultures are required before the release of diphtheria cases. Gaseous fumigation is still

practiced after cases of smallpox. The 62 hospital beds available (23.1 per 100,000 population) were apparently well occupied in 1923, as 3,983 cases were admitted. Although 68 per cent of typhoid cases and 100 per cent of smallpox cases were reported hospitalized, only 10 per cent of diphtheria cases and 5 per cent of scarlet-fever cases were thus cared for. Only 20 per cent of school children are reported to have been vaccinated.

Tuberculosis.—A total of 315 deaths from this disease was recorded, but morbidity data are lacking. The district nurse association performs most of the antituberculosis work in the city, and the 29 nurses made 10,640 visits in behalf of tuberculosis cases. Facilities for diagnosis are provided at the county tuberculosis dispensary, where 454 patients made 1,978 visits. A total of 251 patients was admitted to the county tuberculosis hospital.

Veneral diseases.—According to State law cases are reportable by name and address to the health department, but no records are available to indicate the extent of the problem or the completeness of reporting. A clinic, maintained at the municipal hospital, was attended by 2,074 patients, who made 24,428 visits.

Child hygiene.—Two prenatal clinics are maintained by the district nurse association, one of them at the maternity hospital. Midwives are registered by the State but are otherwise not supervised. Health supervision of the 39,500 children in 50 public schools is under the board of education, which maintains a staff of 8 part-time physicians and 8 nurses, giving a ratio of 1.7 school nurses per 10,000 pupils. Each nurse spends one hour daily in giving classroom talks on health topics, and physicians address the pupils after the completion of the annual physical examinations made of all grade children. Prior to gymnasium activities, pupils in the first two years of high school are also examined. The scope of these examinations is complete, including heart and lungs, although clothing is not removed. Although continuous records are kept of each child, summarized data of defects found and corrected are not available. Three dentists and one hygienist care for those children whose parents are unable to pay for private service. Special classes are provided for mental defectives and for children having various physical defects, including open-air classes for tuberculous pupils. Every child 16 to 18 years old must pass a physical examination given by one of the school physicians before securing working papers.

Mental hygiene.—The district nurse association employs three psychiatrists to hold clinics at the dispensary for women and children.

Industrial hygiene.—There is no record of local activities in this field.

Public-health nursing.—Public-health nursing is specialized and decentralized. A total of 18 nurses was employed by the health department, 9 by the board of education, and 34 by the district nurse association, giving a ratio of 22.8 nurses per 100,000 population.

Laboratory.—A public-health laboratory with a full-time director performs the usual free diagnostic and other laboratory examinations for the city. A total of 102 diagnostic examinations per 1,000 population was made in 1923.

Food.—Milk is obtained from 3,000 to 3,500 dairy farms which are annually inspected by the health department, 3,870 inspections having been recorded. Tuberculin testing of herds producing milk to be sold raw is required. The 23 plants, in which 99 per cent of the milk supply was Pasteurized, are inspected nearly every day and periodically scored. The daily per capita consumption reported was 0.9 pint. Regular inspections are made of food establishments, 34,982 such examinations being reported.

Sanitation.—General sanitary inspections include housing, and efforts are made to abate nuisances as a result of complaints. The 14 sanitary policemen also assist in quarantine work and in food inspections. There were 3,485 privy vaults, mainly in two foreign districts, under the supervision of the health department. Tight receptacles and prompt removal of stable manure are required.

Public utilities.—Ninety-five per cent of the entire population is served by the public water supply, owned by the city. Water derived from the river is treated by coagulation, sedimentation, rapid sand filtration, and chlorination. A total of 3,397 private wells still existed, serving less than 5 per cent of the people. The combined system of sewerage is employed and served 98 per cent of the population.

Public-health education.—There is little official activity in this field except for the occasional use of the daily press and publicity in the city journal. The Toledo Public Health Association is active in general health-education work.

Special comment.—Progress has been made in school health supervision in providing regular physical examinations of all children. Modern measures for communicable-disease control should be adopted, and efforts should be made to secure the reporting and care of cases of tuberculosis and venereal diseases. Infant-welfare work should be developed and midwives should be supervised. Health supervision should be provided for children in parochial schools. General appropriations should be increased, including the salary for the health officer.

TRENTON, N. J.

Trenton is a city of 127,390 people, classified as 68 per cent native white, 25 per cent foreign born, and 7 per cent colored. There were 14,000 people per square mile. The total taxable valuation amounted to \$1,082 per capita.

Administration.—The city is governed by a board of commissioners. The health department is a bureau in the department of public safety. The health officer is appointed by the director of public safety on a part-time basis for an indefinite term, at a salary of \$3,000.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.48 per capita, including \$0.02 for plumbing inspection, which compares with \$0.26 devoted to health purposes in 1920.

Vital statistics.—The collection of vital statistics is a function of an employee of the health department serving as local registrar for the State. Checks of births and death certificates indicate that practically all of the births and all of the deaths are reported. Reports are issued weekly in the newspaper.

Communicable-disease control.—Reporting of principal communicable diseases is reasonably complete. Gaseous fumigation is still practiced after cases of diphtheria, scarlet fever, smallpox, and acute anterior poliomyelitis, and one inspector is employed for the purpose of placarding and fumigating. There are 62 hospital beds per 100,000 population for communicable diseases and these are well utilized. Ninety per cent of the school children have been vaccinated against smallpox.

Tuberculosis.—There were 195 cases of tuberculosis with 151 deaths reported. One municipal clinic and one State clinic are held weekly in the municipal building, while two nurses were employed in home visiting and in clinic work.

There were 263 clinic patients registered (166 new patients) as having made 367 visits to clinics in 1923, while 2,351 nursing visits were made in behalf of tuberculosis cases.

Venereal diseases.—Reports of venereal diseases are transmitted by name and address to the State department, but records are not available in the local health department. At the municipal clinic there were given 2,241 treatments for syphilis, 2,925 for gonorrhea, and 186 other treatments. A total of 217 patients was admitted during the year. One field nurse is engaged in social-service work.

Child hygiene.—There is a division of school medical inspection and welfare nursing. The department of medical inspection is also organized under the board of education for supervision of children of the public schools. Midwives are licensed by the State. There are six infant-welfare clinics operated by the health department, which were attended by 568 children under 2 years of age, who paid 2,254 visits, while 13,251 nursing visits were made to homes. There were also 666 children of ages 2 to 5, inclusive, who visited clinics, a total of 704 visits having been made. There was an average of one physician for 3,200 pupils, and one nurse for 1,100 pupils, including both the public and parochial schools. Examinations of children of the public schools numbered 17,379, with 6,264 defects discovered, while 5,281 defects were corrected among this group. There were 6,434 examinations made of parochial-school children, with 8,964 defects discovered, and 2,960 defects were corrected. Children applying for working papers are required to pass a physical examination given by medical inspectors of the board of education.

Industrial hygiene.—Activities in this field are carried on by the State department of labor.

Public-health nursing.—Fourteen nurses were employed by the health department and 12 nurses by the board of education, giving a ratio of 20 nurses per 100,000 population, exclusive of the 4 nurses provided by nonofficial agencies.

Laboratory.—A chemical laboratory is located in the city hall and a bacteriological laboratory at the filter plant. Specimens for disease diagnosis are submitted to the State department of health laboratory.

Food and sanitation.—One inspector is employed for the supervision of dairies and milk plants, in addition to the staff of the State department of agriculture engaged in this work. Seventy-five per cent of the milk supply was Pasteurized⁴⁸ and 0.6 per cent was of certified grade. The per capita milk consumption amounted to 0.7 pint daily. Permits are issued locally to slaughterhouses, which are also licensed by the State, while bakeries and milk plants are also under State supervision. House-to-house inspections are made in routine in addition to follow-up of nuisance complaints. Plumbing inspection is still a function of the bureau of health.

Public utilities.—The public water supply, owned by the city, is derived from the Delaware River, and is treated by coagulation, filtration, and chlorination before being served to all of the people. Laboratory analyses of the treated water showed *B. coli* present in 0.16 per cent of the 1-cubic centimeter samples. Both the combined and separate systems of sewerage are employed, the former predominating, sewage being discharged untreated into the Delaware River, although treatment plans have been prepared. There were 140 privies in use in outlying districts under the supervision of the health department.

⁴⁸ In 1925, 87.2 per cent.

Public-health education.—The health department publishes an annual report. A child-welfare exhibit has been prepared.

Special comment.—Progress has been made since 1920 in extending the child-hygiene program to include the children of preschool age, but this work should be still further extended to give deserved attention to the prenatal period.⁴⁹ Measures for the control of communicable diseases should conform more closely to the standards approved by the American Public Health Association. Stimulus should be given to the early discovery and reporting of tuberculosis. Increased funds should be provided to include a larger salary for the health officer services, preferably on a full-time basis, and for the extension of the child-hygiene program and health-education work.

TROY, N. Y.

Troy is a city of 72,013 people (1920 census) distributed over an area of 9.3 square miles. The total taxable valuation was \$905 per capita.

Administration.—The city is governed by a mayor and council, the health department operating under the commission of public safety, there being no board of health nor advisory council. The health officer is appointed on a part-time basis by the commissioner of public safety, at a salary of \$2,500, for an indefinite term.

Expenditures.—The total expenditures of the health department in 1923 amounted to \$0.49 per capita, \$0.41 being for health purposes proper, \$0.04 for medical poor relief, and \$0.04 for plumbing.

Vital statistics.—Registration of vital statistics is conducted in accordance with State law, and 99 per cent of the births and 100 per cent of the deaths are considered reported.

Communicable-disease control.—Reporting of the principal communicable diseases is satisfactory in the main, although the ratio of cases to deaths for typhoid (8) is lower than the minimum standard suggested for completeness. Control measures are in accordance with the State sanitary code. It is stated that all the school children have been vaccinated against smallpox.

Tuberculosis.—There were 168 cases of tuberculosis reported, with 65 deaths from this disease. There are two clinics provided, while 3,401 nurses' visits were made to homes in behalf of tuberculosis cases, and 200 beds are available in the county sanatorium for cases needing this care.

Venereal diseases.—Reporting is by name and address to the local and State health department, 205 cases of syphilis and 95 cases of gonorrhea having been reported. A municipal clinic is conducted, where 198 cases of syphilis and 138 cases of gonorrhea received treatment.

Child hygiene.—There is no official organization for prenatal work in the city. One infant-welfare clinic⁵⁰ is maintained at the Troy Hospital, where 205 children under 2 years of age were registered as having made a total of 3,026 visits during the year, 1,417 nurses' visits having been made to homes. Health supervision of children of the public schools⁵¹ is carried on by the board of education, a physical examination being given children of all grades once a year. In accordance with State law, children applying for working papers are required to pass a physical examination before being issued a certificate.

⁴⁹ Within the past year (1925) several prenatal clinics in various parts of the city have been established.

⁵⁰ At present (1925) a prenatal clinic is being developed in cooperation with the child-welfare clinic in the new health-center building.

⁵¹ Nutrition workers employed by the tuberculosis association carried on (1925) special work in 4 of the parochial schools of Troy. One full-time nutrition worker, paid partly by the tuberculosis association, is employed by the Lansingburg school board. Weekly preschool nutrition classes are held in cooperation with the child-welfare department of the board of health and weekly nutrition lectures are given to teachers.

Industrial hygiene.—There is no organized industrial-hygiene work in this city.

Public-health nursing.—Six nurses were provided by the health department, 7 by the tuberculosis association, 3 by the board of education, and 6 by the public-health nursing association, giving a ratio of 22.2 nurses per 100,000 population.

Laboratory.—A public-health laboratory is maintained, where 43 diagnostic examinations per 1,000 population were made during the year.

Food and sanitation.—The dairies producing milk for the city are inspected once a year and tuberculin testing of herds from which raw milk is sold is required in accordance with State regulations. One food inspector is maintained for this work, and general sanitary inspections are made for the abatement of nuisances. Fifteen per cent of the milk supply was Pasteurized. The total per capita milk consumption was 0.8 pint, which is 0.2 pint less than the desired standard.

Public utilities.—The public water supply, owned by the city, is derived from surface sources, but was not treated.⁵² All the population was supplied. The combined sewerage system accommodated 90 per cent of the population, the sewage being discharged untreated into the Hudson River.

Public-health education.—In 1923 there was no organized public-health education work in the city. Now (1925) the Rensselaer County tuberculosis and public-health association have headquarters in the city health building. Public-health education work is organized by this association in cooperation with the school systems and the health department.

Special comment.—The program of prenatal and infant care should be extended, and health supervision should be provided for children of parochial schools. There should be a more active campaign for the early discovery and treatment of tuberculosis cases. Pasteurization of milk should be required and defined by ordinance. Laboratory supervision for the water supply should be instituted. In 1925 a new city health building was opened, in which all the important clinic and laboratory activities of both private and public agencies are conducted.

TULSA, OKLA.

Tulsa is a residential city of 102,018 people, classified as 85.1 per cent native white, 2.9 per cent foreign born, and 12 per cent colored. The population to the square mile was estimated at 10,000. The total taxable valuation amounted to \$868.

Administration.—The city is governed by a mayor and a board of four commissioners. There is a board of health of five members appointed by the mayor and commissioners for a term of two years each. The superintendent of health must be a physician, who serves on a full-time basis at a salary of \$4,200 a year, and is appointed by the mayor and board of commissioners for a term of two years. He has the power to make rules and regulations, issue orders, as well as hear appeals from orders.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.96 per capita, of which \$0.04 was for hospital, \$0.39 for garbage collection and disposal, and \$0.23 for miscellaneous items.

⁵² Since Feb. 1, 1925, the entire water supply of Troy has been chlorinated. Two laboratory examinations of the water are made weekly, one by the waterworks bureau and one by the city laboratory.

Vital statistics.—Registration of vital statistics is conducted by a special registrar employed by the State. It is stated that about 90 per cent of the births are reported and 100 per cent of the deaths. No reports are issued.

Communicable-disease control.—Reporting of diphtheria, scarlet fever, and measles is apparently quite satisfactory, but the ratio of typhoid-fever cases to deaths is only 4.4, as compared with 10 as an indication of completeness. Gaseous fumigation is still practiced after cases of typhoid, diphtheria, scarlet fever, smallpox, measles, cerebrospinal meningitis, and acute poliomyelitis. None of the cases of typhoid is hospitalized, but 5 per cent each of the cases of diphtheria and scarlet fever and 25 per cent of the cases of smallpox are thus cared for. It is reported that 75 per cent of the school children have been vaccinated.

Tuberculosis.—Reports of cases of tuberculosis for the year are not available. Two clinics are maintained, one for white persons and one for colored. There are no facilities for the care of tuberculosis patients by the health department. Nursing service is provided by the county public-health association, which provided six nurses for this work, 6,792 visits having been made to 380 cases during the year.

Venereal disease.—Reporting of venereal diseases is required by State law. The venereal-disease clinic maintained by the State and county for a period was discontinued January 1, 1924.

Child hygiene.—There are no official activities in prenatal or infant hygiene work, but nursing services are provided by the Tulsa County Public Health Association. Supervision of children of the public schools is a responsibility of the board of education, which employs a full-time physician as director of health, together with four nurses. Physical examinations are made of all children upon admission, but up to the present time this has not been sufficiently complete to include the examination of lungs in all cases. A physical examination of children applying for working papers is not required in routine. A total of 180 certificates was issued during the year. There is no organized effort for the care and promotion of mental health.

Industrial hygiene.—There are no activities in this field locally.

Public-health nursing.—There were four nurses employed by the school board and six by the county health association, giving a ratio of 9.7 nurses for 100,000 population.

Laboratory.—A total of 297 examinations, chiefly of milk and water, was made in the public-health laboratory during the year.

Food and sanitation.—The 400 producing dairies are inspected monthly and scored. One-half of the milk supply was Pasteurized, and stimulus is being given to the increase of Pasteurization. The per capita consumption of milk amounted to 0.8 pint daily. Market and food stores are inspected monthly. General sanitary inspections are made as a result of citizens' complaints. Garbage disposal is carried on by the health department by feeding to hogs and incineration. Special measures are directed against fly breeding. One tourist camp is maintained at the outskirts of the city.

Public utilities.—The public water supply, owned by the city, is derived from a river, and is treated by filtration and chlorination before being served to a large proportion of the population.⁵³ Laboratory tests of the treated water showed *B. coli* present in 5 per cent of the 1-cubic centimeter samples. There were approximately 1,000 private wells in use in the city. The separate type

⁵³ Since this survey was made the city has completed the \$8,000,000 Spavanan Creek project and obtains its water from a reservoir where it is chlorinated before being supplied to the city.

of sewerage system is employed and was accessible to 70 per cent of the population. Imhoff tanks and sprinkling filters were being installed for treatment of the sewage before its discharge into the Arkansas River.

Public-health education.—Although there is no organized attempt at health education and publicity the health officer utilizes the press, and members of his staff deliver occasional lectures. Milk and dairy exhibits are prepared for the State fair.

Special comment.—The appropriation for health purposes proper should be increased to provide for a larger nursing staff and for full-time medical health officer service. Measures for the control of communicable disease should conform to standards of the American Public Health Association, and gaseous fumigation as a means of control should be eliminated. An organized campaign for the control of tuberculosis and venereal disease, and for the protection of maternity and infancy is indicated as needed. Employment of a full-time physician as director of school health work is based on sound principles.

UTICA, N. Y.

Utica is a city of 106,490 people, with a population per square mile of 5,666. The total taxable valuation amounted to \$1,021 per capita.

Administration.—A mayor and council govern the city. The bureau of public health is under the commissioner of public safety, who appoints the health officer for a two-year term at a salary of \$3,000 a year on a part-time basis. The medical health officer has broad administrative powers.

Expenditures.—The expenditures of the health department in 1923 amounted to \$0.54 per capita, \$0.04 being for plumbing inspection.

Vital statistics.—The registration of vital statistics is conducted by the health department, and certificates are checked for completeness and accuracy with satisfactory results.

Communicable-disease control.—Measures for the control of communicable diseases comply with the best sanitary standards, except for the continuation of gaseous fumigation after cases of typhoid, diphtheria, smallpox, scarlet fever, and tuberculosis. All of the school children have been vaccinated against smallpox. Ninety per cent of the cases of typhoid, 80 per cent of the cases of diphtheria, and 75 per cent of the cases of scarlet fever were hospitalized during the year. There were no cases of smallpox.

Tuberculosis.—There were 141 cases of tuberculosis with 88 deaths reported. Visits in behalf of tuberculosis cases by nurses numbered 3,966, while clinic visits totaled 305 (161 new patients). A summer camp (Healthmore) is operated for tuberculous cases and is open approximately five months in the year with 40 cases in attendance. Twenty cases were admitted to the hospital in 1923.

Venereal diseases.—There were 195 cases of syphilis and 95 cases of gonorrhea reported. A venereal-disease clinic is maintained at the dispensary, where a total of 5,026 visits was made.

Child hygiene.—The prenatal and infant hygiene work is carried on by the baby-welfare committee, with medical supervision. Prenatal clinics are held at each of the four infant-welfare stations twice a month, where 403 cases were enrolled. Nurses' visits to homes in behalf of prenatal cases numbered 3,556. A total of 25,193 nurses' visits was made in behalf of infant and preschool children, while 3,868 children visited clinics. Health supervision of children of the public schools is carried on by the board of education, which provides for a complete physical examination at least once every three years. There were 6,710 examinations made during the year 1922-23 and

5,372 defects discovered. Children applying for working papers are first required to pass a physical examination given by the health department. There is no systematic work being done for the promotion of mental health.

Industrial hygiene.—There are no activities in this field.

Public-health nursing.—Five nurses were employed by the health department, four by the board of education, and seven by the baby-welfare committee, giving a ratio of 15 public-health nurses per 100,000 population.

Laboratory.—There were made 359 examinations for tuberculosis, 4,191 for diphtheria, 4,000 for syphilis, and 200 for gonorrhea in the laboratory operated at the State hospital, but known as Utica City Laboratory.

Food and sanitation.—Inspections are made at intervals of the dairies producing milk for the city, and tuberculin testing is required of herds from which certified milk is sold, but not for other grades of milk. Fifty-five per cent of the milk supply was Pasteurized. The total per capita milk consumption amounted to 0.8 pint daily. There is no special work in food inspection. General sanitary inspections are made for the abatement of nuisances.

Public utilities.—The public water supply, privately owned, is derived from surface sources and is chlorinated before being served to all of the people. Two per cent of the 10-cubic centimeter samples of treated water showed *B. coli* present. There were approximately 175 private wells in use. Both the combined and separate systems of sewerage are employed, the sewage being discharged untreated into the Mohawk River.

Public-health education.—The health officer utilizes the press at intervals and delivers occasional lectures to nursing groups throughout the year.

Special comment.—There is needed an increased health appropriation to provide for full-time health-officer service, as well as for an increased nursing staff. School health supervision should include children of the parochial schools. Stimulus should be given to the early discovery and prompt reporting of cases of tuberculosis, and increased facilities should be provided for the hospitalization of cases. Health education should be developed as soon as funds and personnel for this work can be obtained.

WASHINGTON, D. C.

Washington is a residential city of 475,966 people, distributed over an area of 69.3 square miles, giving a population per square mile of 6,868. The total taxable valuation was \$2,470 per capita.

Administration.—The city government is headed by three commissioners appointed by the President. There is no board of health nor advisory council, the health officer being appointed by the city commissioners for an indefinite term at a salary of \$4,000, plus \$240 for automobile upkeep. The health department is divided according to its various functions, with directors or supervisors of divisions, whose salaries are in proportion to that of the health officer.

Expenditures.—The health department expenditure in 1923 amounted to \$0.47 per capita, including \$0.04 for plumbing inspection. In 1920, \$0.53 per capita was expended, of which \$0.45 was for health purposes.

Vital statistics.—Registration of vital statistics is conducted by the health department, and from 95 to 97 per cent of the births and 100 per cent of the deaths are reported. Reports are issued monthly.

Communicable-disease control.—The reporting of only four cases of typhoid fever for each death is a much lower ratio (standard 10) than recorded for this city in recent years. Reporting of the other principal epidemic diseases is fairly complete. Spot maps and chronological charts are utilized. Negative

cultures from typhoid convalescent patients are not required for release, and gaseous fumigation is still practiced as a measure of control of diphtheria, scarlet fever, smallpox, cerebrospinal meningitis, acute anterior poliomyelitis, and tuberculosis. There are 360 hospital beds for communicable-disease cases, including 180 beds for tuberculosis cases, and exclusive of facilities offered at the Army and Navy hospitals. Schick testing is carried on in institutions and among school children to a limited degree.⁵⁴ Vaccination against smallpox is compulsory for school children.

Tuberculosis.—Records of the health department show about 4,500 cases. A total of 5,711 clinic patients was on active records, and they made 6,626 visits during the year, while 5,076 nursing visits were made to homes of tuberculosis cases. There were 394 admissions to the tuberculosis hospital.

Venereal diseases.—There are no legal provisions for reporting of venereal diseases,⁵⁵ although 426 cases of syphilis, 384 cases of gonorrhea, and 13 other cases were reported. A total of 11,896 visits was made to the clinic.

Child hygiene.—Of the 9,029 live births and 476 stillbirths, 5,103 occurred in hospitals. Midwives are registered but not otherwise supervised. There were 2,525 children under 2 years of age who paid 20,298 visits to infant-welfare clinics, while 15,473 nursing visits were made to homes. Health supervision of children of the public schools is under the health officer but funds are supplied by the board of education. Children of the first grade and kindergarten are examined yearly, 47,800 examinations having been made and 41,926 defects found, but records of corrections are incomplete. Children applying for working papers must pass a physical examination. No special mental hygiene activities are carried on.

Industrial hygiene.—There are practically no large industries in the city, and the only industrial hygiene work of the health department is that done by sanitary inspectors.

Public health nursing.—There were 16 nurses supplied by the health department, 10 by the board of education, and 41 by voluntary agencies, giving a ratio of 14.1 nurses per 100,000 population.

Laboratory.—A total of 40 diagnostic examinations per 1,000 population was made in the public-health laboratory, in addition to 13,061 analyses of milk and 1,964 analyses of water.

Food and sanitation.—Dairy farms are regularly inspected and scored (7,202 inspections), tuberculin testing of all herds is required, and 96 per cent of the milk supply was Pasteurized. The per capita milk consumption was 0.6 pint daily, or 0.4 pint less than the desired standard. Inspections are regularly made of food establishments and of sanitary conditions in the city.

Public utilities.—The public water supply, owned by the Government, is derived from the Potomac River and is treated by slow sand filtration and chlorination. Laboratory tests of treated water showed *B. coli* present in 1.6 per cent of the 10-cubic centimeter samples. Both combined and separate systems of sewerage are used by 97 per cent of the population, the sewage being treated by sedimentation, screening, and skimming before being discharged into the Potomac Channel 3 miles below the city.

Public-health education.—An annual report is published, weekly and monthly bulletins are issued, and the daily press and health exhibits are utilized.

Special comment.—Progress has been made since 1920 in extending the care given to infants and children. The practice regarding communicable-disease

⁵⁴ In 1924 approximately 9,000 children were immunized.

⁵⁵ By legislation this group of diseases was made reportable in 1925.

control should conform to modern standards, and the antituberculosis program should be materially extended. Public-health educational work should be organized in a systematic campaign.

WATERBURY, CONN.

Waterbury is an industrial city of 98,411 people, classified as 74 per cent native white, 25 per cent foreign born, and 1 per cent colored. The city occupies an area of 29 square miles, giving a population per square mile of 3,393. The total taxable valuation was \$1,534 per capita.

Administration.—The city is governed by a mayor and board of aldermen. There is a board of health of seven members appointed by the mayor for terms of six years. It is required that one of the members of this board shall be a physician and one an alderman, with not more than four members of the same political party. The city health officer is a physician appointed on a full-time basis for an indefinite period at a salary of \$4,500. The power of appointment and dismissal of subordinates and of making rules and regulations rests with the board of health. The fixing of salaries is a duty of the board of finance subject to the approval of the board of aldermen.

Expenditures.—The total expenditures by the health department in 1923 amounted to \$0.87 per capita, \$0.59 being set aside for health purposes proper and \$0.28 for the collection and disposal of garbage.

Vital statistics.—Registration of vital statistics is conducted by the town clerk. The International List of Causes of Death is used, and certificates of births and deaths are checked, with the result that 98 per cent of the births are found to be reported, and practically 100 per cent of the deaths.

Communicable-disease control.—Reporting of cases of diphtheria and scarlet fever seems to be fairly complete, but only 8 cases per death of typhoid, 40 cases per death of measles, and 9 cases per death of whooping cough were reported to the health department. Methods for the control of the communicable diseases correspond in general with standards approved by the American Public Health Association. Hospital facilities for diphtheria and scarlet fever are inadequate, with the result that no cases are thus cared for, although 75 per cent of the cases of typhoid and 100 per cent of the cases of smallpox are hospitalized. From 96 to 98 per cent of the school children have been vaccinated in accordance with requirements for school entrance.

Tuberculosis.—A total of 126 cases with 50 deaths was reported. Clinic facilities are provided by the antituberculosis league once a week, and 155 clinic patients are on the active records. A total of 1,990 visits was made by nurses of the antituberculosis league in behalf of these cases. Hospital facilities are provided in State sanatoria.

Venereal diseases.—Reporting in accordance with the State law is by office number to the local health department, 8 cases of syphilis and 16 cases of gonorrhea having been reported. One clinic is operated by the health department, where 470 cases of syphilis, 83 cases of gonorrhea, and 10 other cases were treated during the year. There is no nursing or social service personnel provided for follow-up work.

Child hygiene.—Of 2,217 live births, 20 per cent were attended by midwives, who are licensed by the State and under the supervision of the State department of health. Thirty-nine per cent of the births occurred in hospitals. Special instruction to prospective mothers is given in the homes by the visiting nurse association. There are six infant-welfare clinics maintained by the visiting nurse association, and 600 children under 2 years of age paid a total of 2,815 visits to these clinics during the year, while 9,922 nursing visits were

made to homes. School health supervision is carried on by a health department staff and includes care of children of the private and parochial schools, as well as of the public schools. An effort is made to give a complete physical examination annually to all grade school children. Of 3,241 defects found, 1,822 were reported corrected. A physical examination by any practicing physician is required of children applying for working papers.

Mental hygiene.—Except for the activities of the division of mental hygiene of the State department of health and the maintenance of one mental clinic by a private agency, relatively little is done locally for the care and promotion of mental health.

Industrial hygiene.—Industrial-hygiene activities are confined to the work done in individual factories.

Public-health nursing.—There is no separate bureau of nursing in the health department, although 14 nurses were employed in communicable-disease and infant-welfare work, while 11 nurses from the visiting nurse association were engaged in bedside, tuberculosis, and infant-welfare nursing. This gives a ratio of 25.4 nurses per 100,000 population.

Laboratory.—The usual free bacteriological and chemical service is provided in the health-department laboratory. A total of 58 diagnostic examinations per 1,000 population was made in 1923.

Food.—The 315 dairies are inspected and scored twice a year by inspectors of the city health department and of the food and dairy commission of the State. Tuberculin testing of herds from which milk is to be sold raw is required by State and local ordinances. Fifty per cent of the milk supply was Pasteurized by the holding process. The average per capita milk consumption amounted to 0.8 pint daily, which is less by 0.2 pint than the minimum amount desired. Inspections of sanitary conditions of restaurants, kitchens, fruit stands, and meat markets are made at irregular intervals, and licenses are issued for the maintenance of restaurants and slaughterhouses.

Sanitation.—Inspections of general sanitary conditions are made by four sanitary inspectors, both as a result of citizens' complaints and upon the initiative of the health department, for the discovery and abatement of nuisances. Collection and disposal of garbage was still handled by the health department, the method of disposal being by feeding to hogs. Special measures directed against flies include a regulation requiring storage of manure in closed vaults.

Public utilities.—The public water supply, owned by the municipality, is obtained from surface sources and treated by storage and chlorination. Ninety-five per cent of the population is served. Laboratory supervision of the water supply is maintained by both city and State laboratories. It is estimated that there are 1,000 private wells still in use in outlying districts. The separate system of sewerage is employed and accommodated 75 per cent of the population. The sewage is discharged raw into the Naugatuck River.

Public-health education.—There is no organized campaign of public-health education, although the health officer utilizes the daily press and occasionally delivers lectures on health subjects in the schools and before civic organizations.

Special comment.—Effort should be made to stimulate reporting of measles, whooping cough, and venereal diseases, and hospital facilities should be provided for cases of diphtheria and scarlet fever.⁵⁶ Facilities for the care of maternity and infancy should be extended to provide prenatal clinics and pre-school care. There should be developed an active campaign of public health education.

⁵⁶ A new 85-bed hospital has been completed since the survey and receives all types of communicable-disease cases. Prenatal clinic service has also been extended by the addition of two clinics.

WICHITA, KANS.

Wichita is a residential city with a population of 79,261, all but 6 per cent of whom are native white stock. The city occupies an area of 20.8 square miles, giving a population per square mile of 3,810. The total taxable valuation was \$1,415 per capita.

Administration.—A commission and city manager govern the city. There is no board of health nor advisory council, the direction of the health department being in charge of the director of public welfare, who is appointed by the city manager for an indefinite term at a salary of \$4,000. He has broad administrative powers for carrying on the health work of the city.

Expenditures.—The total expenditures by the health department in 1923 amounted to \$0.77 per capita, but of this only \$0.28 per capita was expended for health work proper, inasmuch as \$0.02 was set aside for hospitals, \$0.45 for garbage and refuse collection, and \$0.02 for weed cutting.

Vital statistics.—The collection of vital statistics is a function of the city clerk, returns being made to the State department of health, but not filed in the local health department.

Communicable-disease control.—Reporting of the principal communicable diseases is satisfactory, except for typhoid fever. An average of only 3.5 cases per annual death from this disease is reported, which is only one-third of the standard indicated for completeness. There are 25 hospital beds per 100,000 population, but these are evidently not fully utilized, as only 1 per cent of the diphtheria cases and none of the scarlet fever cases are cared for in hospitals. Gaseous fumigation is still practiced after cases of typhoid, diphtheria, scarlet fever, smallpox, and cerebrospinal meningitis. About 60 per cent of the school children have been vaccinated, although it is not a required procedure.

Tuberculosis.—The fact that only 25 cases of tuberculosis were reported with 26 deaths is an indication of incompleteness. There is one clinic available and follow-up work is done by nurses of the public-health nursing association, a total of 130 beds being available in county and State institutions.

Venereal diseases.—Reporting in accordance with State and municipal regulations is by office number to the health department, there having been 256 cases of syphilis and 352 cases of gonorrhea reported. A venereal-disease clinic is conducted by the health department, and 158 cases of syphilis and 128 cases of gonorrhea were treated during the year.

Child hygiene.—One prenatal clinic is maintained by voluntary agencies, 120 cases having made 173 visits during the year. An infant-welfare clinic is also provided by voluntary agencies, 438 children under 2 years of age having paid 1,622 visits to the clinic, while 7,036 nurses' visits were made in behalf of children of this age period. Health supervision of children of the public schools is carried on by the board of education. Physical inspections are made by nurses. There were 14,153 inspections made and 16,039 defects corrected during the year. There is no special examination required of children applying for working papers, and no organization of industrial hygiene activities. There is no organization of activities for the promotion of mental health.

Public-health nursing.—Seven nurses were provided by the board of education and 18 by the local nursing association, giving a ratio of 31.5 nurses per 100,000 population.

Laboratories.—In the public-health laboratory there were made 37 diagnostic examinations per 1,000 population during the year.

Food and sanitation.—Dairies producing milk for the city are regularly inspected and scored, and tuberculin testing of all cattle is required. From 75 to 80 per cent of the milk supply was Pasteurized. The total per capita

milk consumption was 1 pint per day. All food-handling establishments are regularly inspected. General sanitary inspections are made chiefly as a result of citizens' complaints for the abatement of nuisances. The disposal of garbage and refuse is still handled by the health department, disposal being by hog feeding.

Public utilities.—The public water supply, privately owned, is derived from wells and is chlorinated before being served to 80 per cent of the population. Laboratory analyses of the treated water showed *B. coli* absent in 10-cubic centimeter samples. The separate system of sewerage was chiefly utilized, and 75 per cent of the population was served, the sewage being discharged untreated into the Arkansas River. There were approximately 3,000 privy vaults in outlying districts. These are inspected on the average once a year by the health department, as shown by inspections made.

Public-health education.—The health officer utilizes the daily press and publishes an annual report which forms a part of the general city report.

Special comment.—Considerably more than half the total appropriation of the health department is devoted to activities which are no longer considered strictly health functions, leaving a very small appropriation for health promotion and disease prevention. Measures for the control of communicable diseases should conform more closely with the standards approved by the American Public Health Association. Early discovery and prompt reporting of cases of tuberculosis should be stimulated, and nursing service for the discovery and follow up of tuberculosis, as well as for maternal and infant care, should be provided by the health department, in addition to services rendered by other agencies. The program of health supervision of school children should be extended to those of the parochial schools, and should provide for complete physical examination, including heart and lungs, by a physician, at least three times during school life. Health educational work should be developed.

WILKES-BARRE, PA.

Wilkes-Barre is an industrial city with an estimated population of 76,258, and occupies an area of 4.8 square miles, giving a population per square mile of 15,887. The per capita taxable valuation of \$1,115 is about the average for cities of this study.

This city is governed by a mayor and four councilmen. The administration of the health department is under the superintendent of public safety. There is no health officer nor board of health, the city council acting in the capacity of such a board. There is no organized effort for education and publicity in regard to health affairs. The per capita expenditure for health in 1923 amounted to only \$0.27.

Vital statistics are handled by the city clerk who is local registrar for the State, but no effort is made to check reports of births and stillbirths. Activities directed toward the control of communicable disease consist primarily in the employment of a city physician. Case reports are received, and houses are placarded by sanitary inspectors. The ratio of typhoid cases to deaths in 1923 of 3.8 is an indication of lax reporting of this disease,⁵⁷ but the ratios for diphtheria (14.1), scarlet fever (61), measles (282), and whooping cough (206) are creditable. It is reported that 100 per cent of the school children are vaccinated and that there has been only one case of smallpox in six years.

⁵⁷ In 1924, 4 cases of typhoid within city limits and 7 cases from outside the city, but brought to the hospital, with 1 death were reported.

Through money made available by the State in 1922, 3,000 preschool children were immunized by three doses of toxin-antitoxin.⁵⁸ One hospital of 12 beds is available for acute communicable disease. No antituberculosis work is carried on by the city except in connection with a diagnostic and advisory clinic which is maintained by the State, assisted by the city and semiofficial charity agencies. No data are available as to the number of patients in attendance. There is no concerted effort by official agencies to discover cases of venereal disease and secure treatment, except in connection with the general outpatient clinic maintained by State and city agencies.

Three prenatal clinics are maintained, one at the State clinic headquarters and two in connection with hospitals, with medical attendants provided. The visiting nurse association also has five prenatal clinics without medical service. There were 2,249 live births reported, with 932 attended by midwives, who are supervised by the State medical inspector. At the State clinic an infant-welfare service is maintained, and 78 babies were under care during the year. The board of education has charge of school health supervision, which includes in its scope a complete physical examination yearly of every pupil of the 32 public and parochial schools. A total of 33,000 examinations and inspections are recorded for 1924. In all, 9,402 teeth defects were found and 6,884 corrected; 2,254 cases of enlarged tonsils, with removal in 731 cases; 1,390 adenoid defects, with 731 corrected; and 1,663 eye defects, with 431 corrected. Health instruction includes the use of toothbrush drills, charts, and special talks. Nurses are maintained by the board of education but none by the health department.

Municipal ordinances require that milk must either come from tuberculin-tested herds or be Pasteurized.⁵⁹ Inspection of distributing plants is irregular and scoring is not practiced. The city laboratory has been discontinued. All the people of the city receive water from a privately owned supply, which is obtained from surface sources and is treated by storage, filtration, and chlorination. The sewage is discharged untreated into the Susquehanna River below the city. Less than 50 privies were in use, and efforts are made to eliminate them. General sanitary inspection is performed by four inspectors, whose chief duties consist in nuisance abatement. The use of concrete bins for stable manure, with frequent cleaning, is the chief measure directed against fly breeding.

Special comment.—The official health organization seems to be particularly weak for a city of this size and evidently needs increased funds and reorganization, with the formation of a board of health and the provision of full-time medical health officer service. This is the first step, which should be followed by the development of a modern sanitary code and adequate health machinery for disease control and health promotion. Wilkes-Barre has an unusual opportunity to do constructive health work if its responsibility in this regard is accepted and a sufficient corps of trained workers obtained.

WILMINGTON, DEL.

The population of Wilmington was 117,728, classified as 75 per cent native white, 15 per cent foreign born, and 10 per cent colored. The city occupies an area of 11.4 square miles, giving a population per square mile of 10,327. The total taxable valuation was \$1,011 per capita.

⁵⁸ Approximately 9,000 children have now been immunized (1925) against diphtheria in the city and adjoining area covered by the community welfare federation.

⁵⁹ In 1925 between 90 and 95 per cent of the milk supply was Pasteurized.

Administration.—The city is governed by a mayor and council. A paid board of health of five members, four of whom are appointed by the mayor to serve for a term of two years, holds two meetings each month. Two members must be physicians. The health officer and secretary of the board is appointed by the board for a term of two years at a salary of \$1,300. The position is not under civil service.

Expenditures.—The total expenditures by the health department in 1923 amounted to \$0.77 per capita, \$0.18 being for health purposes and \$0.59 for garbage collection and disposal. In 1920, \$0.39 per capita was expended, \$0.16 being for health purposes and \$0.23 for garbage and refuse disposal.

Vital statistics.—Registration of vital statistics is conducted by the secretary of the board of health, and checks are made of completeness of birth and death certificates, while reports are issued weekly and monthly.

Communicable-disease control.—Reporting is satisfactory for typhoid fever, but only about half the cases in proportion to annual deaths are reported which might be expected. There are only 17 hospital beds for communicable-disease cases per 100,000 population, or less than half the number advised.

Tuberculosis.—Cases of tuberculosis are reported by card to the State board of health. One clinic is maintained at the Delaware Hospital, and home nursing is supplied by the visiting nurse association.

Venereal diseases.—Two clinics are provided for venereal diseases, where 465 cases of syphilis, 433 cases of gonorrhea, and 76 other cases received treatment.

Child hygiene.—The State health and welfare commission conducts five infant-welfare clinics. A total of 88 midwives was registered. Supervision of children of the public schools is exercised by the board of education, and efforts are made to examine children of all grades once a year. Of 1,680 children found with defects as a result of 6,567 examinations, 1,076 received the benefit of corrections. Children under 16 years applying for working papers must pass a physical examination in order to receive a certificate to work. No mental hygiene work is done in the city.

Industrial hygiene.—There are no official activities in this field.

Public-health nursing.—Four nurses were employed by the board of education, 13 by the visiting nurse association, and 6 by the State health and welfare commission, giving a ratio of 19.5 nurses per 100,000 population.

Laboratory.—A laboratory was established in January, 1924.

Food and sanitary inspection.—Milk inspection is carried on by a department, and 75 per cent of the milk supply was Pasteurized, the per capita daily consumption being 0.6 pint. General food inspection is carried on by the regular sanitary inspectors, who are also engaged in the abatement of nuisances.

Public utilities.—The public water supply, owned by the city, is derived from Brandywine Creek and is filtered and chlorinated before being served to all the people. Laboratory analyses showed *B. coli* in 3.7 per cent of the 1-cubic centimeter samples of treated water. The combined sewerage system was accessible to 93 per cent of the population. The sewage is discharged untreated into the bay.

Public-health education.—A report is published biennially and monthly bulletins are issued, while the daily press is utilized.

Special comment.—There is need for increased appropriation for health services, including increased salary for the provision of full-time health officer service. Increased bed capacity is needed for communicable-disease cases, including tuberculosis and venereal diseases, and prompt reporting of these

diseases should be stimulated. Midwives should be supervised. The milk supply should be closely supervised and records of inspections maintained, while increased milk consumption should be stimulated.

WORCESTER, MASS.

Worcester is an industrial city of 191,927 people, of whom 69.7 per cent were classified as native white, 29.7 per cent as foreign born, and 0.6 per cent as colored. An area of 38.4 square miles is occupied, giving a population per square mile of 5,024. The taxable valuation was \$1,409 per capita.

Administration.—The city is governed by a mayor, aldermen, and council, with a standing committee on public health consisting of three aldermen and four councilmen. A paid board of health of three members, one of whom must be a physician, is appointed by the mayor and confirmed by council for overlapping terms of three years each. Weekly meetings are held. The health officer is also director of school hygiene, and is appointed by a civil-service board at a salary of \$4,500. The salary of the executive officer in 1920 was \$2,800. Although there are no qualifications required for the executive officer by law, the present director of health is a physician. The department is in the process of reorganization under separate functional divisions and the sanitary code is also being revised.

Expenditures.—The total expenditure of the department of health in 1923 was \$1.25 per capita, of which \$0.80 was spent for hospitals, \$0.04 for plumbing inspection, and \$0.03 for refuse incinerator. This represents an increase of \$0.29 per capita for health work over the 1920 figures.

Vital statistics.—The city clerk acts as registrar and reports to the State. The International List of Causes of Death is used. At the end of each year a house-to-house canvass (costing \$918) is made to check up birth reporting.

Communicable-disease control.—The ratio of cases reported per death for the acute communicable diseases compares favorably with the situation in most cities of this class. Case records are kept for typhoid, diphtheria, scarlet fever, lobar pneumonia, and encephalitis (lethargic), and spot maps are used for the more common diseases. Considerable educational work has been done to arouse interest in the importance of the Schick test and immunization measures for the control of diphtheria, and approximately 2,500 have thus far been immunized. It is stated that 95 per cent of school children have been vaccinated. One hospital bed for the care of acute communicable diseases is supplied for 1,519 of the population, while 75 per cent of the cases of diphtheria and 60 per cent of the cases of scarlet fever are thus cared for.

Tuberculosis.—A total of 151 deaths (137 pulmonary) and 241 cases (212 pulmonary) were reported in 1923, with a total of 54 beds available for the care of advanced cases, in addition to other facilities in State and private sanatoria. Three clinics are operated at different hospitals, two independent of the health department. At the health department clinic 756 patients were registered and 955 visits were made in 1924. Nursing visits by the health department to tuberculosis cases numbered 2,078. Approximately 400 children were enrolled in controlled fresh-air units in the schools, and provision is made through cooperation with the Southern Worcester County Health Association for children physically below par to attend a well-supervised summer camp.

Venereal diseases.—Under the State law, cases of venereal diseases are reported by number to the State department of health, but the record of those in the city is not known to the health officer. A treatment clinic is maintained at

the city hospital, financed by the State, but no record is available as to the number of patients.

Child hygiene.—Prenatal clinics are maintained at the city and memorial hospitals. There were 4,425 live births during the year, with 2.8 per cent of all deliveries by midwives, who are not supervised. Seven infant-welfare clinics are maintained by the district nursing association, with physicians in attendance at four. The nurses of this organization made 30,770 baby-welfare visits and 5,577 prenatal visits to homes. The civic league also has an infant clinic with volunteer medical service. Five part-time physicians and 13 nurses were employed in the health supervision of the 38,679 children enrolled in the 71 public and parochial schools. Physical examinations of each child are made annually by the physicians assisted by nurses and teachers. A total of 70,636 examinations and inspections was made in 1923. Records of defects corrected are somewhat incomplete, but show that tonsils were removed in 428 of the 551 cases recorded; adenoids recorded in 361 cases were removed in all the cases; while of 532 cases with defective eyesight 427 procured glasses. Examinations of children under 16 desiring working papers are made by the family or school physician.

Public-health nursing.—Public-health nursing service is of a specialized character. The 23 nurses of the health department are under the immediate direction of the health officer, while the district nursing association had 34 staff nurses and 5 supervisors in addition to the director. This gives a total of 32.3 nurses per 100,000 population.

Laboratory.—Much of the diagnostic laboratory work is still done at the city hospital or is sent to the State laboratory. It is reported that 67 diagnostic examinations per 1,000 population were made during the year.

Food.—Milk is obtained from 1,300 to 1,500 dairies, which are inspected as frequently as possible by the one inspector, 892 inspections having been made, without scoring, in 1923. Although there is no law requiring Pasteurization, 80 per cent of the supply was thus treated. The per capita consumption of 0.43 pint per day was less than half the desired standard of 1 pint per person. Licenses are issued to sausage factories, slaughterhouses, bakeries, and bottling establishments, and permits are required to keep poultry houses. Food handlers are not physically examined.

Sanitation.—Plumbing has recently been transferred from the health department, while garbage disposal by hog feeding is under the overseers of the poor. General sanitary inspection consists primarily of nuisance suppression as a result of inspection following complaints. Special measures against fly breeding call for tight, covered pits. There are no special measures against mosquitoes or rodents.

Public utilities.—All the population is served by the public water supply which is owned by the city and under the supervision of a water commissioner. The supply is protected by storage, and control of the purity of water is in the hands of the State department of health. Most of the sewage is treated by precipitation and a small portion by sand filtration, but a new treatment plant consisting of Imhoff tanks and intermittent filters is under construction.

Public-health education.—Education and publicity are conducted by the director of health, who publishes an annual report of 350 copies, gives special lectures, and utilizes the press.

Special comment.—Since 1920 a medical health officer has been secured at a salary of \$1,700 over that previously allowed. The health department has been partially reorganized and its staff increased to undertake problems other than those of environmental sanitation which have been emphasized previously. The

department still needs increased nursing service with trained supervisors as well as directors of tuberculosis and venereal-disease work. Prenatal and infant clinic service should be increased with provision of medical service in all cases. The Pasteurization of all milk not from tuberculin-tested herds should be required, and increased milk consumption should be stimulated.

YONKERS, N. Y.

Yonkers is a city of 107,521 people, classified as 73 per cent native white, 25 per cent foreign born, and 2 per cent colored. The population per square mile is 4,900. The total taxable valuation amounted to \$1,845 per capita.

Administration.—A mayor and board of aldermen govern the city. There is an advisory council of five members appointed by the mayor for a four-year term. The health officer is appointed by the mayor on practically a full-time basis at a salary of \$5,000 a year. He has broad administrative powers.

Expenditures.—The expenditures of the health department in 1923 amounted to \$1.74 per capita, \$0.74 being for hospitals, \$0.07 for plumbing, and \$0.05 for medical poor relief. The expenditures of the department in 1920 amounted to \$1.63 per capita, \$0.94 being for health purposes proper and \$0.69 for hospital service.

Vital statistics.—Registration is conducted by the registrar of vital statistics, checks being made regularly for completeness and accuracy with satisfactory results.

Communicable-disease control.—Reporting of communicable diseases is reasonably complete, as shown by the ratio of cases to deaths. Thirty-five per cent of the cases of typhoid, 30 per cent of the cases of diphtheria, 50 per cent of the cases of scarlet fever, and 100 per cent of the cases of smallpox have been hospitalized. All of the children of the public and parochial schools have been vaccinated against smallpox.

Tuberculosis.—There were 262 cases with 86 deaths reported. Nurses' visits in behalf of tuberculosis cases numbered 7,286, while 780 clinic patients were on active records as having made 1,926 visits to clinics. There are available 82 hospital beds in local and private institutions, to which 112 patients were admitted during the year.

Venereal diseases.—There were 213 cases of syphilis and 137 cases of gonorrhea reported by name and address to the health department. One clinic is maintained at the city hospital, where 162 cases of syphilis, 122 cases of gonorrhea, and 191 other cases were treated. Three physicians, one nurse, and one social worker were employed.

Child hygiene.—One prenatal clinic is operated by nurses. Midwives are licensed by the State and supervised by the health department. Of a total of 2,392 live births, 25 per cent were attended by midwives. Visits by nurses to prenatal clinics numbered 1,346 a year, while nurses' visits in behalf of infants under 2 years of age numbered 9,927. A total of 1,317 children paid 8,524 visits to clinics. Health supervision of children of the public schools is carried on by the board of education, while inspection of the children of the parochial schools is a function of the health department. A complete physical examination is given children of all grades once a year. A total of 21,936 defects was discovered among children of the public schools in 1923 and 18,304 defects were corrected. Children applying for working papers are first required to pass a physical examination given by a health department physician. A mental hygiene clinic is held twice each month by

the State hospital committee at one of the local hospitals for the purpose of advice and observation of special cases.

Industrial hygiene.—There is no activity in this field by local agencies.

Public-health nursing.—Sixteen nurses were employed by the health department, and 6 by the board of education, giving a ratio of 20.4⁶⁰ nurses per 100,000 population.

Laboratory.—A public-health laboratory is maintained where 50 diagnostic examinations per 1,000 population were made during the year, in addition to bacteriological and chemical analyses of food and water.

Food and sanitation.—Systematic supervision is exercised over the milk supply by the health department. Ninety-eight per cent of the milk supply was Pasteurized, while the remainder was from tuberculin-tested herds. The per capita milk consumption amounted to 1 pint daily. Inspections are made of premises where foods are kept and sold, and licenses are issued to restaurants. General sanitary inspections are made particularly as a result of citizens' complaints for the abatement of nuisances. Plumbing inspection is still a function of the health department.

Public utilities.—The public water supply, owned by the city, is derived from surface sources and treated by chlorination, part of it also by slow sand filtration, before being served to all of the people. Laboratory analyses of 1 cubic centimeter samples of treated water showed *B. coli* present in 2.2 per cent of the samples. Both combined and separate sewerage systems are employed, sewage being discharged untreated into the river.

Public-health education.—The health commissioner utilizes the daily press and delivers occasional lectures on health subjects.

Special comment.—Progress has been made since 1920 in extending the school hygiene program, although a more economic service might develop if children of the public and parochial schools were both supervised by one organization. The health department might derive considerable benefit from an organized program of health education to be developed as soon as funds and personnel permit.

YOUNGSTOWN, OHIO

Youngstown is an industrial city of 150,436 population, 69.4 per cent classified as native white, 25.6 per cent as foreign born, and 5 per cent as colored. The area covered is 25 square miles, giving a ratio of 6,017 people per square mile. The taxable valuation was \$2,217 per capita.

Administration.—A mayor and council govern the city. The mayor appoints a board of health of five members for terms of five years. This board makes rules and regulations, fixes salaries, and has unlimited power during epidemics. The health officer, as in 1920, is a part-time official appointed by the board of health, at a salary of \$2,280. The law requires that he be a physician, but he is not under civil service and may be removed at the pleasure of the board.

Expenditures.—The per capita expenditure of the health department in 1923 amounted to \$0.44, of which \$0.16 was for garbage disposal and \$0.03 for plumbing inspection, leaving \$0.25 for health purposes as compared with \$0.31 in 1920. In addition, \$0.14 per capita is expended by the board of education for school hygiene and \$0.21 for mental hygiene.

Vital statistics.—Registration under the health department is conducted by the bacteriologist who serves as registrar. Certificates are checked, and re-

⁶⁰ Exclusive of four nurses employed by voluntary agencies.

porting of births is said to be over 99 per cent complete. Tabulations are made by months and years, and data are classified by age, sex, and nativity.

Communicable-disease control.—The health officer, aided by a district physician and the sanitary police, handles the communicable-disease work. The ratio of cases reported for each annual death is considerably below the standard of the American Public Health Association, especially for typhoid, scarlet fever, and measles. Cases of measles are isolated for a two weeks' period instead of one. A total of 23.9 beds per 100,000 population is available in the communicable-disease hospital, approximately half of them being set aside for smallpox cases, 25 per cent of which are thus cared for. None of the diphtheria and scarlet-fever cases are hospitalized, although half of the typhoid-fever cases are cared for in hospitals. Three-fourths of the school children have been vaccinated.

Tuberculosis.—Reporting is quite incomplete, as judged by the fact that 111 deaths were recorded with 112 cases reported. The health department takes no active part in antituberculosis work. A chest clinic, two days a week, is maintained through the cooperation of State, city, and county agencies, in addition to two hospital dispensaries, where 1,102 patients were treated. Nursing visits by the visiting nurse association in behalf of tuberculosis cases numbered 2,456 visits to 295 cases.

Venereal diseases.—According to State and municipal regulations, cases are reported by name and address to both the State and local health departments, 134 cases of syphilis, 45 cases of gonorrhea, and 3 other cases having been reported in 1923, or approximately half the number reported in 1921. Women offenders brought before the court are examined, and if found infected are detained until rendered noninfectious. Two diagnostic clinics are held at local hospitals.

Child hygiene.—There are no health department activities for the promotion of child health. A total of 404 expectant mothers received instruction from nurses in their homes. Of the 4,222 live births, 23 per cent were attended by midwives, who are supervised by the State medical society. Only 43 babies were said to have been born in hospital. Seven infant-welfare clinics maintained by private agencies registered 1,713 babies who made 7,349 clinic visits. A total of 32,336 home visits was made to 5,133 infants cared for at home by the 17 visiting nurses. The 27,081 children enrolled in the 46 public schools are supervised from the standpoint of health by a staff consisting of a physician and a dentist, each part time, and 6 full-time nurses (2.2 per 10,000 pupils) employed by the board of education. All children are inspected annually by the nurse and more frequently by the teacher, and special cases are referred to the physician for complete physical examinations. Parochial schools maintain supervision over their pupils. Special clinic facilities are provided in local hospitals. A child over 16 years of age who has passed the seventh grade may be issued a certificate to work.

Mental hygiene.—A special staff is maintained, including a physician, to examine school children to detect feeble-mindedness and study child problems, as well as to supervise special classes for backward children. This staff also holds a weekly clinic at court and makes examinations for delinquency of cases before the juvenile court.

Industrial hygiene.—This work is carried on by large industrial plants, but otherwise no consideration is given to the problem locally except by the visiting nurses.

Public-health nursing.—There were no nurses employed by the health department, the visiting nurse association providing 17, and the board of education 6, giving a ratio of 15.3 per 100,000 population.

Laboratory.—A limited number of bacteriological examinations, chiefly of water and milk, and of typhoid, tuberculosis, and diphtheria specimens are made in the local laboratory. The diagnostic examinations numbered 51 per 1,000 population, exclusive of those made in laboratories other than that of city health department.

Food.—Under the food and dairy division, inspections are made of the 1,376 dairy farms producing milk for the city, 3,546 inspections having been recorded. Tuberculin testing of herds whose milk is to be sold raw and bottled at the farm is required. There are 19 milk plants, which are inspected twice a week, 60 per cent of the total supply being Pasteurized. Inspections are regularly made of food-handling establishments, and licenses are issued to restaurants.

Sanitation.—General sanitary inspection includes the usual scope of activities in addition to plumbing inspection. From 3,000 to 4,000 privy vaults in use are inspected once a year by the sanitary inspectors. The disposal of garbage and refuse was handled by the health department until the close of 1923, when this activity was properly transferred to the city engineer.

Public utilities.—The public water supply is owned by the city and served 90 per cent of the population. The water is derived from the Mahoning River within city limits, and is treated by coagulation, sedimentation, and rapid sand filtration. There were approximately 3,000 wells in use by 10 per cent of the population residing in outlying districts of the city and in a new area annexed in 1922. The combined sewerage system served 85 to 90 per cent of the population, the raw sewage being discharged into the river.

Public-health education.—There is an effort to educate the public in health affairs through the school curriculum and the press.

Special comment.—Considerable increase in appropriation, including a larger salary for the health officer, is necessary if Youngstown is to carry out a modern health program through its health department. Measures for communicable-disease control should be modified to conform to accepted standards. Efforts should be made to stimulate reporting of tuberculosis cases, and to care for known cases of this disease. A complete physical examination by a physician, to include heart and lungs, should be given each child at least three times during school life, and continuous records of defects found and corrected should be maintained. An extension of public-health laboratory work is indicated as desirable in a city of this size. A staff of public health nurses should be added to the health department.

APPENDIX
COMMON SCHEDULE USED FOR FIELD SURVEYS¹

PUBLIC HEALTH SURVEY

City of _____
State of _____
Made by _____

From _____ to _____ 192____

OFFICE OF
ADMINISTRATIVE HEALTH PRACTICE
U. S. PUBLIC HEALTH SERVICE

City of _____

TABLE OF CONTENTS

Section	Source of information
A. Descriptive data_____	_____
B. Organization of health department_____	_____
C. Activities of nonofficial agencies_____	_____
D. Health department administration_____	_____
E. Education and publicity_____	_____
F. Vital statistics_____	_____
G. Control of communicable diseases_____	_____
H. Control of tuberculosis_____	_____
I. Control of venereal diseases_____	_____
J. Promotion of child health (including pre-natal and infant welfare, care of the pre-school child, school health supervision, and working papers)._____	_____
K. Care and promotion of mental health_____	_____
L. Industrial hygiene_____	_____
M. Public-health nursing_____	_____
N. Public-health laboratory_____	_____
O. Control of milk supply_____	_____
P. Control of foodstuffs_____	_____
Q. Control of drugs_____	_____
R. Control of water supply_____	_____
S. Control of excreta disposal_____	_____
T. General sanitation_____	_____
U. Reports on clinics, substations, etc_____	_____
V. Miscellaneous_____	_____

¹ This schedule covered 64 pages, each 8½ by 11 inches, multigraphed in single-spaced typewriting.

City of _____

A. DESCRIPTIVE DATA

1. *Population:*

U. S. Census, 1920_____ Estimated 192— _____
 Foreign born_____ % Colored_____ %
 Principal nationalities_____
 Seasonal changes_____
 Nonresident population_____

2. *Area of city:*

Total area_____ Population per square mile_____
 Per cent built up or improved_____ Parkage_____
 Changes or additions since 1920_____

3. *Type of community:*

Residential or industrial_____
 Note principal industries_____
 General economic status_____
 Well-to-do__% Wage earners__% Owning homes__% Indigent__%
 Intercourse with other cities_____

4. *Municipal government:*

Form of organization_____
 Administrative divisions_____

5. *Finances* (year_____):

Total revenue, \$_____ Total expenditures, \$_____
 Total taxable valuation: Personal, \$_____ Real, \$_____
 Tax rate: City, \$_____ State \$_____
 Classification of expenditures (append copy of city annual report), classify
 by departments or activities)_____

6. *Civic organizations:*

What civic organizations are active or interested in health promotion_____

 What health activities are being carried on by them_____

7. *Comment:*

City of _____

B. ORGANIZATION OF HEALTH DEPARTMENT

1. *General plan of organization:*

2. *Laws, ordinances, and regulations* (secure 2 copies of each):

Is there a sanitary code_____ Date adopted_____
 General scope_____
 Have adequate legal provisions been made_____
 Is enforcement satisfactory_____
 Comment_____

3. *Advisory council:*

Is there an advisory council_____ No. members_____ Salaries, \$_____
 How appointed_____ Term of office_____
 What are its duties_____
 Relation to health officer_____
 Comment_____

4. *Board of health:*

Is there a board of health_____ No. members_____ Salaries, \$_____
 How appointed_____ Term of office_____
 Qualifications prescribed for membership_____
 Number of physicians required_____
 Number of meetings per month_____ Attendance_____
 What functions are performed by board_____

 Comment_____

5. *Health officer:*

Title of position_____
 Name_____ Salary, \$_____
 Age_____ Length of service_____ Time given to duties_____
 Education_____ Experience_____
 How appointed_____ Term of office_____
 Is he a member of board_____ Has he its support_____
 Is position under civil service_____ Municipal or State_____
 Qualifications prescribed by law_____
 Has he other official duties_____
 Does he engage in outside activities_____
 Legal procedure for his removal_____

6. *Powers and duties of health officer:*

Does health officer, board, or some other body—
 Appoint and dismiss subordinates_____
 Fix salaries_____
 Make rules and regulations_____
 Issue orders_____
 Hear appeals from orders_____
 Summon and swear witnesses_____
 Abate insanitary conditions _____
 Promulgate special emergency regulations_____
 Comment_____

7. *Other personnel:*

Appointed by_____ Salaries fixed by _____
 Under civil service_____ Exceptions_____
 Is time record kept_____
 Is tenure of office affected by political changes_____
 Are ample qualifications prescribed for appointment_____
 Residence requirements _____
 Comment_____

8. *Office facilities:*

Location_____ Number of rooms_____ Floor space_____
 Private office for executive_____ Bureau heads_____
 Is entire department in same building_____ Exceptions_____
 Are quarters suitable_____ Provisions for library_____
 General tone of office_____
 Comment_____

9. *Transportation facilities:*

What provisions are made_____
 Number of motor vehicles_____
 Other means of travel_____
 Comment_____

10. Licenses, permits, etc., issued by health department:
What permits are issued_____
What licenses are issued_____
Total number of permits issued_____ Licenses_____
Records kept _____
Comment_____

11 Receipts by health department:
Sources of receipts_____
Disposition of receipts_____
Total receipts for year (_____), \$_____
Comment_____

12. Purchases by health department:
How are purchases made_____
By whom_____
Approved by_____ Audited by_____
Character of purchases made_____
Comment_____

13. Financial statement:
Fiscal year ends_____ Is budgetary system used_____
Estimates prepared by_____ Approved by_____
Are transfers authorized_____
Provisions for emergency funds_____
Comment_____

City of_____

TABLE I.—Classification of municipal expenditures

Activity or bureau	Department in charge	Salaries	Other	Total
Administration_____				
Educational and publicity_____				
Vital statistics_____				
Communicable diseases_____				
Control of tuberculosis_____				
Control of venereal diseases_____				
Infant hygiene_____				
School hygiene_____				
Public-health nursing_____				
Control of milk_____				
Control of other foodstuffs_____				
Public-health laboratory_____				
General sanitation_____				
Mosquito eradication_____				
Rodent control_____				
Garbage disposal*_____				
Plumbing inspection*_____				
Housing inspection*_____				

* NOTE.—Wherever possible, classify expenditures by divisions or activities as indicated; otherwise classify by existing administrative allotments. Include the expenditures for items marked (*) even if not conducted by the health department.

TABLE II.—*Recapitulation, expenditures for health (year -----)*

Total expenditures, health department-----	\$-----
Total expenditures, other departments-----	-----
Total expended by nonofficial agencies-----	-----
Grand total expended for health service-----	-----
Expended per capita by municipality-----	-----
Expended per capita by other agencies-----	-----

TABLE III.—*Annual expenditures and receipts, health department*

Year	1919	1920	1921	1922	1923
Total budget-----	-----	-----	-----	-----	-----
Expended-----	-----	-----	-----	-----	-----
Receipts-----	-----	-----	-----	-----	-----

City of -----

C. ACTIVITIES OF NONOFFICIAL HEALTH AGENCIES

NOTE.—Give here a general summary or write-up of the activities of all nonofficial, private, or voluntary agencies engaged in public-health service, including name of organization, local representative, personnel engaged, salaries, expenditures, sources of funds, scope of activities, special features, etc., sufficient to give a clear picture of the character and effectiveness of services so rendered. Wherever possible secure published statements or reports prepared by these agencies. Ascertain the attitude, zeal, and intelligent interest displayed by the voluntary agencies and the extent of their cooperation with the official authorities and their understanding of the general public-health problem. Tabulations of work undertaken should be reserved for separate activities discussed later in report.

City of -----

D. HEALTH DEPARTMENT ADMINISTRATION

1. *Administrative office:*

Executive officer-----
Other personnel-----
Office facilities-----
Expenditures: Total salaries, \$----- Other, \$----- Total, \$-----
Duties of executive officer-----

Comment-----

2. *Classification or division of activities:*

NOTE.—Give according to bureau or division into which the department is divided for administrative purposes. Otherwise classify by functions or activities undertaken in order to indicate the scope and plan of organization. If any of the personnel are divided between two or more activities, indicate this fact. Use "WT" for whole-time and "PT" for part-time service. Append annual report, etc. (2 copies), showing organization, personnel, expenditures, etc.

TABLE IV.—*Administrative organization*

Division	Chief	Other personnel	Scope of activity

City of_____

E. EDUCATION AND PUBLICITY

1. *Organization:*

Conducted by whom_____

Other personnel engaged_____

Expenditures: Salaries, \$_____ Printing, etc., \$_____

Other, \$_____ Total, \$_____

Facilities_____

Comment_____

2. *Publications:*

Annual report_____ No. copies_____ No. of pages_____ Cost, \$_____

Mo. bulletins_____ No. copies_____ No. of pages_____ Cost, \$_____

_____ No. copies_____ No. of pages_____ Cost, \$_____

Pamphlets, etc.____ No. copies_____ No. of pages_____ Cost, \$_____

Mailing lists_____

How distributed_____

Comment_____

3. *Press notices:*

Prepared by_____ Total cost, \$_____

Subjects covered_____

Frequency_____ Average number in year_____

Comment_____

4. *Lectures:*

Delivered by_____ Total cost, \$_____

Number in year_____ Average attendance_____ Total_____

Subjects covered_____

Groups reached_____

Is stereoptican used_____ Motion pictures used_____

Subjects covered_____

Films, etc., owned by department_____

Comment_____

5. *Exhibits:*

What exhibits have been prepared_____

Conducted by_____ Total cost, \$_____

Exhibits owned by department_____

Number of times exhibited_____ Attendance_____

Exhibits displayed at office_____

Comment_____

6. *Special publicity:*

Outline_____

7. *Training courses for nurses, teachers, etc.:*
Scope -----

8. *Activities of voluntary agencies:*
Outline -----

- City of -----

F. VITAL STATISTICS

1. *Legal provisions* (secure 2 copies of all laws, regulations, etc.) :
Are they enforced -----
Number of prosecutions for failure to report : Births ----- Deaths -----
Number of convictions for failure to report : Births ----- Deaths -----
Penalties -----
Are burial permits required ----- Issued by whom -----
Comment -----
2. *Registration:*
In registration area for : Births ----- Deaths ----- Admitted -----
Registration conducted by -----
Registrar ----- Time ----- Salary, \$ -----
Other personnel -----
Expenditures : Salaries, \$ ----- Other, \$ ----- Total, \$ -----
Are standard certificates used -----
Fees charged for copies of certificates, \$ ----- Total received, \$ -----
Received by ----- Disposition -----
Fees paid for reporting, \$ ----- Total paid, \$ -----
Comment -----
3. *Records and reports:*
Reports received by health department -----
Records filed in health department -----
Returns made to State department -----
Is International List of Causes of Death used -----
Are certificates checked or verified -----
Completeness and accuracy -----
Probable percentage reported : Births ----- Deaths -----
Stillbirths -----
Tabulations made : Weekly ----- Monthly ----- Annually -----
Tables prepared : Nativity ----- Sex -----
Age ----- Cause ----- Other -----
Reports issued ----- Frequency ----- No. copies -----
Distribution -----
Nonresidents -----
Comment -----

4

TABLE V.—*Sources of reports*

	Physicians	Midwives	Others
Per cent births reported by -----			
Per cent deaths reported by -----			

5

TABLE VI.—*Births and deaths*

Year	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
Total births.....										
Stillbirths.....										
Total deaths.....										
Death rate.....										

6.

TABLE VII.—*Deaths by causes*

NOTE.—Secure list of deaths classified by principal causes for a period of five years.

City of.....

G. CONTROL OF COMMUNICABLE DISEASES

(See also Sections H–I)

1. *Organization:*

Is there a separate bureau or division of communicable diseases.....
If not, how are control measures organized.....
.....
Under supervision of..... Time..... Salary, \$.....
Office facilities.....
Transportation.....
Expenditures: Salaries, \$..... Other, \$..... Total, \$.....
Comment.....

TABLE VIII.—*Personnel, services, and expenditures*

NOTE.—Classify here only the personnel engaged in the control of communicable diseases. If tuberculosis, venereal diseases, or other special disease is organized under a separate division or bureau, do not include in this table; otherwise, include all items of expenditures properly chargeable to “Control of communicable diseases.”

Classification of personnel	Duties or services	Salaries or expenses

2. *Notification:*

List of diseases reportable (secure copy of law).....
Is model State law for morbidity report used.....
How are cases reported: By card..... Phone..... Other means.....
Reports received by..... Filed by.....
Is notice of recovery or death required..... Are they received.....
Are schools notified..... Are dairies notified.....
Are nonresident cases included in records.....
Probable percentage of cases reported.....
Comment.....

TABLE IX.—Percentages of cases reported

Disease	Total deaths	Cases reported	Probable number of cases	Accepted ratio cases to deaths	Estimated percentage cases reported
Typhoid.....					
Diphtheria.....					
Scarlet fever.....					
Tuberculosis (pulmonary).....					
Measles.....					
Whooping cough.....					
.....					
.....					

3. Investigation of cases:

In charge of_____ Time_____ Salary, \$_____

Other personnel: Physicians_____ Nurses_____ Others_____

Duties of physicians_____

Nurses_____

Others _____

Data secured at first visit_____

Instructions given_____

Literature used_____

Other action taken_____

What attempts are made to determine—

Contacts_____

Carriers_____

Source of infection_____

Is investigation adequate_____

Comment_____

4. Epidemiological studies:

In charge of_____ Time_____ Salary, \$_____

Other personnel _____

Are current studies made of: Chronology_____ Distribution_____

Age_____ Sex_____ Race_____ Color_____

Other special studies_____

Records kept_____

Case records for_____

Spot maps for_____

Chronologic charts for_____

Are studies sufficient to detect mild outbreaks_____

Comment_____

TABLE X.—Practice in communicable diseases

Disease	* Are cases reported?	Per cent cases visited	By whom ¹	Average number of visits to each case	How is diagnosis verified? ²	Are special epidemiologic cards kept?	Is spot map kept?	Is chronologic chart kept?	Is house, room, or apartment placarded? ³	Are cases isolated? ⁴	Period of isolation in days	Per cent cases hospitalized	Is "concurrent" disinfection carried out?	Are "contacts" immunized?	Are cases visited before discharged? ⁵	Is "terminal" disinfection carried out?	Remarks
Typhoid.....																	
Diphtheria.....																	
Scarlet fever.....																	
Smallpox.....																	
Measles.....																	
Mumps.....																	
Whooping cough.....																	
Chicken pox.....																	
Meningitis, cerebrospinal.....																	
Poliomyelitis, acute anterior.....																	
Influenza.....																	
Pneumonia.....																	
Tuberculosis.....																	
.....																	
.....																	

¹ Use "P" for physician; "N" for nurse; "I" for inspector.
² Use "L" for laboratory diagnosis; "Cl" for clinical diagnosis.
³ Use "H" for house; "R" for room; "Ap" for apartment.
⁴ Use "A" for absolute quarantine; "M" for modified quarantine.
⁵ Use "G" for gaseous fumigation; "C" for cleaning.

5. *Control measures:*

In charge of _____ Time _____ Salary, \$ _____
 Other personnel _____
 How are cases placarded _____
 How is "quarantine" maintained _____
 Is it effective _____
 Is "Concurrent disinfection" (bedside care) left entirely to private
 physician _____
 If not, what is done _____
 Are materials supplied free _____
 Is "Terminal disinfection" required _____ What form _____
 Usual procedure _____
 How are cases released _____
 What is done to control—
 Contacts _____
 Carriers _____
 Are control measures effective _____
Special measures for control of—
 Typhoid fever _____
 Diphtheria: Is antitoxin provided free _____
 Extent used as prophylactic _____ Curative _____
 How are cases released _____
 Is Schick test used _____
 Number tested _____ Number immunized _____
 Smallpox: General prevalence _____
 Last general vaccination _____
 Per cent school children vaccinated _____ General population _____
 Is hospitalization required _____ Facilities _____
 Rabies: General prevalence _____
 Number of cases treated _____ By _____
 Results _____
 Malaria: Is malaria prevalent _____ Per cent cases reported _____
 Number of cases reported: 1920 _____ 1921 _____ 1922 _____ 1923 _____
 Has malaria index been taken _____
 Per cent of population infected _____
 Are diagnostic facilities provided _____ Are they used _____
 Is prophylactic quinine used _____
 Treatment facilities provided _____
 Number of cases treated _____ Results _____
 Are measures for prevention and control adequate _____
 (For mosquito control, see Section T.)
 Plague: Last record of human plague _____
 Last record of rodent plague _____
 Is there commercial intercourse with infected or suspected places _____
 Are adequate provisions made for—
 Reporting _____
 Diagnosis _____
 Prophylactic sera, etc _____
 Treatment _____
 Rodent control _____
 (See Rodent eradication measures, Section T.)
 Comment _____

6. *Hospitalization:*

Facilities provided_____

Are they adequate_____

General policy adopted_____

Are nonresidents admitted_____ How many_____

Number of hospitals available for (year_____)—

Communicable diseases__	Total beds_____	Number admitted_____
Tuberculosis_____	Total beds_____	Number admitted_____
Smallpox_____	Total beds_____	Number admitted_____
_____	Total beds_____	Number admitted_____

Comment_____

7. *Medical relief to poor:*

What provisions are made_____

In charge of_____ Time_____ Salary, \$_____

Other personnel _____

Expenditures: Salaries, \$_____ Other, \$_____ Total, \$_____

Is medical service provided_____

Is nursing service provided_____

Is dispensary service provided_____

Number of cases provided with medical care_____ Nursing care_____

Other relief furnished _____

Comment_____

8. *Notes:*

City of_____

H. PREVALENCE AND CONTROL OF TUBERCULOSIS

1. *Health department activities:*

Is there a separate bureau or division handling tuberculosis_____

How organized_____

In charge of_____ Time_____ Salary, \$_____

Other personnel _____

Expenditures: Salaries, \$_____ Others, \$_____ Total, \$_____

State health department_____

Activities _____

Comment_____

2. *Voluntary agencies:*

What agencies are active in antituberculosis work_____

Brief outline of program_____

Extent coordination with health department_____

Comment_____

(Write up each voluntary agency engaged in this work, including personnel, expenditures, program, record of work, etc., sources of funds, sale of Christmas seals, etc.)

TABLE XI.—*Personnel*

	Physicians	Nurses	Others (specify)
Municipal.....
State or county.....
Voluntary or industrial.....
Total.....

3. *Notification:*

Is tuberculosis reportable..... Per cent cases reported.....

Efforts to secure complete reporting.....

Probable number of existing cases.....

Comment.....

TABLE XII.—*Tuberculosis statistics*

Year	1919	1920	1921	1922	1923
Total deaths:					
Pulmonary.....
Other forms.....
Total cases reported:					
Pulmonary.....
Other forms.....

4. *Prevention and diagnosis:*

Legal provisions.....

Is there an antispitting ordinance..... Is it enforced.....

Number of arrests (year.....)..... Number of convictions.....

Provisions for compulsory segregation.....

Number of thus segregated.....

Efforts to register known cases.....

Have tuberculosis surveys been made.....

Educational measures.....

Facilities for diagnosis (see Section U).....

Clinics.....

Dispensaries.....

X ray.....

Laboratory examination.....

Extent of antituberculosis work.....

Municipal.....

Voluntary.....

Comment.....

5. *Facilities for care and treatment:*

Health department.....

In charge of..... Time..... Salary, \$.....

State.....

County.....

Private.....

Is free treatment available: Public..... Private.....

5. *Facilities for care and treatment*—Continued.

Open-air schools _____
 Attendance _____
 Preventoria _____
 Attendance _____
 Sanatoria for advanced cases _____
 Admissions _____
 Other facilities _____
 Comment _____

TABLE XIII.—*Hospital facilities (year_____)*

Name of institution	Number of beds, city cases		Total number admitted	Per cent classed as—			Average length of stay	Average cost per patient per day
	Adults	Children		Inc.	Mod.	Adv.		

6. *Follow-up and aftercare:*

Health department _____
 State _____
 Private _____
 Efforts at vocational placing _____
 Nursing service _____
 Number of nurses: Municipal _____ Other _____
 Generalized _____
 Instructive _____
 Bedside _____
 Number of visits (year_____) _____ Number of cases _____
 Average period observation _____
 Medical service _____
 Comment _____

7. *Notes:*

City of _____

I. PREVENTION AND CONTROL OF VENEREAL DISEASES

1. *Health department activities:*

Is there a separate bureau or division of venereal diseases _____
 In charge of _____ Time _____ Salary, \$ _____
 Other personnel _____
 Expenditures: Salaries, \$ _____ Other, \$ _____ Total, \$ _____
 Outline program _____
 Effectiveness _____
 Comment _____

Federal, \$_____ State, \$_____
Outline program_____
Comment_____

Outline program_____

Relation to official agencies_____

Comment_____

Legal provisions-----
 State law----- Municipal law-----
 Are cases reported by name and address----- Office number-----
 To health department----- To State department only-----
 Are probable sources of infection reported to health department-----
 Is this information utilized-----
 Do reports show: Chronic gonorrhea----- New attacks-----
 Number of previous attacks-----
 Whether syphilis is recurrent-----
 Whether chemical prophylaxis was used-----
 Do nonvenereal clinics report neurosyphilis or late manifestations-----
 Is there an increase or decrease in number of physicians reporting-----
 Probable cause-----

Cases reported	1919	1920	1921	1922	1923
Syphilis.....					
Gonorrhea.....					
Other.....					

Legal provisions (secure 2 copies)_____

Is isolation enforced_____ How_____

Number of cases isolated: Male_____ Female_____ Total_____

Is chemical prophylaxis provided_____ Advocated_____

Effect on incidence_____

Diagnostic facilities_____

Number of examinations for—Syphilis: Wassermann_____ Dark
field_____ Other_____

Gonorrhea: Smear_____ Comp
fixation_____

Examinations of food handlers, barbers, etc_____

Number of infections detected_____

Efforts to detect "carriers"_____

Comment_____

Provided by health department		
In charge of	Time	Salary, \$
Other personnel		
Expenditures: Salaries, \$	Other, \$	Total, \$
State department		
Other agencies		

6. *Treatment* (see Section U)—Continued.

Clinics -----
 Number of cases treated: Syphilis----- Gonorrhea----- Other-----
 Number of cases syphilis sterilized-----
 Is clinic equipped for accurate diagnosis----- Adequate treatment -----
 Hospitals-----
 Number of beds available for: Syphilis----- Gonorrhea-----
 Other-----
 Number of persons treated: Syphilis----- Gonorrhea-----
 Other-----
 Nursing service-----
 Number of nurses----- Number of visits-----
 Social service-----
 Number of workers----- Number of visits-----
 Does intravenous medication tend to discourage treatment-----
 Would intramuscular or subcutaneous medication tend to more sustained treatment-----
 Extent of practice of "quacks"-----
 Use of nostrums-----
 Comment -----

7. *Legal and protective measures:*

Is anything done-----
 Extent of prostitution-----
 Is there a "restricted area"----- Number of inmates-----
 Extent of control-----
 Compulsory segregation-----
 Arrests of sex offenders----- Number of arrests-----
 Action taken-----
 Examinations made-----
 Detention-----
 Institutional reform of sex delinquents-----
 Results-----
 Care of unmarried mothers and children-----
 Supervision of dance halls, theaters, etc-----
 Are examinations made to detect neurosyphilis in: Persons responsible for serious accidents----- Criminals----- Loafers-----
 Anarchistic agitators-----
 Are probation officers provided----- Policewomen-----
 Duties -----
 Attitude of police-----
 Courts -----
 Physicians -----
 Public -----
 Comment-----

8. *Educational campaign:*

Have any efforts been made toward—
 Sex education in schools----- Churches----- Societies-----
 Use of pamphlets, exhibits, motion pictures, etc-----
 Providing literature in libraries, etc-----
 "Keeping clean" campaigns and value of soap and water-----

8. *Educational campaign*—Continued.

Outline other activities_____

Have educational measures accomplished anything_____

Specify_____

Comment_____

9. *Notes*:_____

City of_____

J. PROMOTION OF CHILD HEALTH

I. ORGANIZATION

1. *Health department activities*:

How organized_____

Under supervision of_____ Time_____ Salary, \$_____

Other personnel_____

Expenditures: Salaries, \$_____ Other, \$_____ Total, \$_____

Scope of activities_____

Prenatal_____

Infant_____

Preschool_____

School_____

Children in industry_____

Comment_____

2. *Board of education* (health promotion and health education) :

How organized_____

Under supervision of_____ Time_____ Salary, \$_____

Other personnel_____

Expenditures: Salaries, \$_____ Other, \$_____ Total, \$_____

Scope of activities_____

Health promotion_____

Health teaching_____

Physical education_____

Relations with health department_____

Comment_____

3. *Private and volunteer agencies*:

Agencies engaged_____

Personnel_____

Expenditures: Salaries, \$_____ Other, \$_____ Total, \$_____

Scope of activities_____

Prenatal_____

Infant_____

Preschool_____

School_____

Relations with Health department_____

Comment_____

TABLE XV.—*Recapitulation—Expenditures and personnel*

	Total expenditures				Personnel			
	Pre-natal	Infant	Pre-school	School	Physicians	Nurses	Dentists	Others
Health department.....								
Board of education.....								
Total.....								

II. PRENATAL WELFARE (OFFICIAL)—CARE OF EXPECTANT MOTHER

1. *Organization:*

How organized.....
In charge of..... Time..... Salary, \$.....

	Other personnel			
	Physicians	Nurses	Dentists	Others
Whole time.....				
Part time.....				
Salaries.....				

Expenditures: Salaries, \$..... Other, \$..... Total, \$.....
Office facilities.....
Comment.....

2. *Registration of expectant mothers:*

Efforts to secure.....
Number of registered..... Per cent of total.....
Efforts to regulate employment.....
Comment.....

3. *Material mortality:*

Mortality per 1,000 live births.....
Per 1,000 births (including stillbirths).....

4. *Prenatal clinics* (write-up also under Section U) :

In charge of..... Time..... Salary, \$.....
Attendance at clinics.....
Efforts to secure.....
Per cent of expectant mothers attending.....
Scope of service.....
Medical
Examinations.....
Other
Nursing.....
At clinics.....
Home service.....
Instructive
Other
Records kept.....
Studies made.....
Comment.....

5. *Provisions for obstetrical care:*

By health department-----
 In charge of----- Time----- Salary, \$-----
 Other personnel-----
 Expenditures: Salaries, \$----- Other, \$----- Total, \$-----
 By other agencies-----
 Hospital facilities-----
 Number of beds: Free----- Pay----- Charge made-----
 Number of deliveries in hospital----- Maternal mortality-----
 Outpatient service-----
 Number of deliveries (year-----)----- Maternal mortality-----
 Number of visits by physicians----- Nurses----- Average per case-----
 Follow-up-----
 Educational program-----
 Comment-----

6. *Control of midwives:*

Legal provisions-----
 Required to report: Births----- Stillbirths----- Septic cases-----
 Serious complications----- Criminal practice-----
 Enforcement-----
 Prosecutions----- Number-----
 Effect-----
 Extent of supervision-----
 In charge of----- Time----- Salary, \$-----
 Is registration required----- Fee, \$----- Term-----
 Number of registered (year-----)----- Number licensed-----
 Number of licenses revoked-----
 Number of births attended by midwives (year-----)----- Per cent all births-----
 Number of maternal deaths-----
 Maternal mortality per 1,000 deliveries-----
 Number of stillbirths reported----- Per cent of total deliveries-----
 Efforts to train midwives-----
 Special classes-----
 Obligatory or voluntary----- Attendance-----
 Records kept-----
 Comment-----

7. *Control of ophthalmia neonatorum:*

Legal provisions-----
 Notification-----
 Use of silver solution-----
 Enforcement-----
 Notification: Mandatory----- Optional-----
 Number of cases reported (year-----)-----
 Prophylactic measures-----
 Under supervision of----- Time----- Salary, \$-----
 Is use of silver solution required----- Is it carried out-----
 Distribution: Gratuitous----- At cost-----
 Distributed by----- To whom-----
 When to be used-----
 Enforcement-----
 Effect on incidence of infection-----

7. Control of ophthalmia neonatorum—Continued.

Treatment facilities-----
In charge of----- Time----- Salary, \$-----
Free treatment-----
Number of cases treated (year-----)-----
Number of cases blindness recorded-----
Records kept-----
Comment-----

III. PRENATAL WELFARE—PRIVATE OR NONOFFICIAL AGENCIES

Write up nonofficial activities directed to promotion of prenatal care of expectant mothers, including name, personnel, cost data, character of services rendered, and tabulation of activities. Determine the extent of supervision by and relation to health department:

IV. INFANT WELFARE (OFFICIAL)

1. Organization:

How organized-----
In charge of----- Time----- Salary, \$-----
Other personnel-----
Expenditures: Salaries, \$----- Other, \$----- Total, \$-----
Comment-----

2. Infant mortality:

Trend-----
Records kept-----
Studies made-----
Comment-----

TABLE XVI.—Infant mortality

Year	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
Total births-----										
Stillbirths-----										
Total deaths under 2 years-----										
Deaths, diarrhea and enteritis under 2 years-----										
Death rate per 1,000 live births-----										
Death rate, all causes under 2 years-----										

3. Infant-welfare clinics (write-up also under Section U) :

Number of clinics----- Location----- Hours-----
In charge of----- Time----- Salary-----
Efforts to secure attendance-----
Success-----
Character of service-----
Medical-----
Nursing-----
Feeding-----
Instructive-----
Home supervision-----
Educational program-----

3. *Infant-welfare clinics* (write-up also under Section U)—Continued.

Little mothers' leagues-----
Records kept-----
Comment-----

TABLE XVII.—*Clinic activities, official and nonofficial*

	Number of clinics	Number of babies registered	Total under care	Total visits to clinics	Total visits to homes		Number cared for at home	Is milk provided?
					Physi- cians	Nurses		
Health department----- -----								

4. *Infant milk depots:*

Number operated by health department----- Location-----
When opened----- Hours-----
In charge of----- Time----- Salary, \$-----
Other personnel-----
Expenditures: Salaries, \$----- Other, \$----- Total, \$-----
Sources of milk----- Grades----- Quality-----
Number of gallons milk distributed (year-----)----- Free-----
Charge, \$-----
Number of babies supplied----- Average length of attendance-----
Facilities provided-----
Medical-----
Nursing-----
Instructive-----
Other-----
Results-----
Records kept-----
Cost data-----
Comment-----

5. *Day nurseries:*

Number: Municipal----- Private-----
Under supervision of----- Time----- Salary, \$-----
Number of babies cared for: Municipal----- Private-----
Results-----
Records kept-----
Cost data-----
Comment-----

6. *Infant boarding houses:*

Number----- Location-----
Legal provisions-----
Enforcement-----
Under supervision of----- Time----- Salary, \$-----
Extent of supervision-----
Provisions for medical care, etc-----
General conditions-----
Number of babies boarded (year-----)----- Number of deaths-----
Records kept-----
Cost data-----
Comment-----

7. *Illegitimate births:*

Legal provisions_____

Enforcement_____

Number recorded (year_____) _____ Records kept_____

Abandoned babies_____ Number_____

Provisions for_____

Comment_____

8. *Notes:*

V. INFANT WELFARE (PRIVATE OR NONOFFICIAL AGENCIES)

Write-up nonofficial activities directed to promotion of infant welfare.
Determine the extent of supervision by and relation to health department:

VI. CARE OF THE PRESCHOOL CHILD (OFFICIAL)

1. *Organization:*

Are special provisions made_____

In charge of_____ Time_____ Salary, \$_____

Other personnel_____

Expenditures—Salaries, \$_____ Other, \$_____ Total, \$_____

Comment_____

2. *Estimated population of preschool ages (2 to 5 years, inclusive).*3. *Scope of activities:*

Medical_____

Nursing_____

Nutrition_____

Dental care_____

Mental hygiene_____

Physical defects_____

Communicable diseases_____

Comment_____

4. *Preschool centers or clinics (write-up under section U) :*

Number_____ Location_____ Hours_____

In charge of_____ Time_____ Salary, \$_____

Number of children registered_____ Number under care_____

Physical examinations_____ Number of examinations_____

Follow-up_____

Nutrition classes_____ Attendance_____

Results_____

Hospital facilities_____

Facilities for country convalescence_____

Facilities for fresh-air care_____

Provisions for placing-out_____ Number placed_____

Supervision_____

Records kept_____

Cost data_____

Comment_____

5. *Nursery schools:*

Number_____ Operated by_____

Charges, \$_____ Number enrolled_____

Under supervision of_____ Time_____ Salary, \$_____

Requirements for admission_____

Hours of attendance_____

Program_____

Extent of health supervision_____

Records_____

Cost data_____

Comment_____

6. *Notes:*

VII. CARE OF THE PRESCHOOL CHILD (NONOFFICIAL)

Write up nonofficial activities directed to the care of the preschool child.
Determine the extent of supervision by and relation to health department:

VIII. SCHOOL HEALTH SUPERVISION

1. *School population:*

Total number enrolled: Elementary grades_____ High_____ Total_____

TABLE XVIII.—*School enrollment*

Year _____	Public	Private	Paro- chial	Total
Number of schools.....	_____	_____	_____	_____
Total enrollment.....	_____	_____	_____	_____
Average daily attendance.....	_____	_____	_____	_____

2. *Expenditures, health supervision of schools:*

Total expenditures by health department_____ \$_____ Cost per
pupil \$_____

Total expenditures, board of education_____

Total expenditures, other sources_____

Grand total_____

NOTE.—Append copy of budget or report showing how expenditures are made for school health supervision, health education, and physical training.

3. *Health department activities:*

How organized_____

Under supervision of_____ Time_____ Salary, \$_____

Expenditures: Salaries, \$_____ Other, \$_____ Total, \$_____

Scope _____

Medical supervision_____

Health instruction_____

Physical training_____

Other activities_____

Comment_____

4. Board of education activities:

How organized_____

Under supervision of_____ Time_____ Salary, \$_____

Other personnel_____

Expenditures_____

Scope _____

Medical supervision_____

Health instruction_____

Physical training_____

Other activities_____

Supervision by health department_____

Comment_____

5. Private and parochial schools, health supervision:

Extent supervision by health department_____

Facilities provided_____

Medical supervision_____

Correction of defects_____

Clinical facilities_____

Special classes_____

Control communicable diseases_____

Health instruction_____

Physical training_____

Playground facilities_____

Records kept_____

Cost data_____

Comment_____

6. Medical inspection of schools:

In charge of_____ Time_____ Salary, \$_____

TABLE XIX.—Personnel.

	Number	Depart- ment	Full time	Part time	Number of hours		Ratio of examiners to number of pupils
					Day	Week	
Physicians_____							
Nurses_____							
Teachers_____							
Dentists_____							

Duties of physicians_____

Nurses_____

Teachers_____

Others_____

Comment_____

7. Physical examinations:

Conducted by Physician_____ Nurse_____ Teacher_____

Grades examined_____

Frequency _____

On admission_____ Periodic_____

Scope of examination: Weight_____ Height_____ Vision_____

Hearing_____ Heart_____ Lungs_____

Sufficient to detect mental defectives_____

Complete_____ Partial_____ Is clothing removed_____

7. *Physical examinations*—Continued.

Reexaminations----- Made by-----
 Scope----- Frequency-----
 Purpose-----
 Records kept----- By whom-----
 Continuous or separate-----
 Use of records-----
 Total number of examinations (year-----) on admission: Complete-----
 Partial-----
 Total reexaminations: Complete----- Partial-----
 Purpose served by examinations-----
 Action taken-----
 Are parents present-----
 Comment-----

8. *Records of defects*:

How kept-----
 By whom----- Where-----
 Comment-----

TABLE XX.—*Record of defects (year -----)*

School	Total exami- nations	Made by—	Types of defects recorded						Total number of defects
			Teeth	Tonsil	Adenoid	Eyes	Hearing	Mental	
Public-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Private-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Parochial-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

What records of previous years are kept-----
 Comment-----

9. *Corrections of defects*:

Outline procedure-----
 Public-----
 Private-----
 Parochial-----
 Are parents notified----- By whom-----
 How-----
 Follow-up----- By whom-----
 Number of visits to homes: Physicians----- Nurses-----
 Number of cases followed up: Physicians----- Nurses-----
 Attitude of parents-----
 Attitude of physicians-----
 Facilities provided for corrections-----
 Health department-----
 Board of Education-----
 Fees charged-----
 Supplies furnished-----
 Number treated in hospital-----
 Defects so treated-----
 Comment-----

TABLE XXI.—*Defects corrected (year_____)*

	Total corrected	Teeth	Tonsils	Adenoid	Eyes	Hearing
Public:						
C_____						
P_____						
Per cent_____						
Private:						
C_____						
P_____						
Per cent_____						
Parochial:						
C_____						
P_____						
Per cent_____						

NOTE.—C—Defects certified current year. P—Defects certified previously.

- Number of corrections at clinics_____
- By private physicians _____
- Comment_____
10. *Clinical facilities (write up under Section U) :*
- Number of clinics_____
- By health department_____
- By board of education_____
- By other agencies_____
- Adequacy of provisions_____
- Attendance _____
- Efforts to secure_____
- Attitude of physicians_____
- Minor surgery_____
- First aid _____
- Comment_____
11. *Control of communicable diseases:*
- Provisions made_____
- By health department_____
- By board of education _____
- Procedure _____
- Are daily or emergency examinations made_____
- By whom_____
- Action taken _____
- Exclusion of sick_____
- Contacts _____
- Procedure_____ Number excluded _____
- Is health department notified_____
- Procedure _____
- Action taken _____
- Are pupils referred to parents_____ Physicians_____ Clinics_____
- Requirements for readmission_____
- Vaccination requirements_____
- Number vaccinated (year_____): Health department_____
- Board of Education_____ Outside_____
- Per cent school population vaccinated_____

11. *Control of communicable diseases*—Continued.

Are school authorities notified by health department of cases of communicable diseases occurring at pupil's residence_____

How _____

Action taken _____

Coordination existing between health department and board of education in the control of communicable diseases_____

Comment_____

12. *School nursing service* (see also Section M) :

Provisions made_____

By health department_____

By board of education _____

Is school nursing service separate from other nursing activities_____

Extent supervision by health department_____

Personnel: Health department_____

Board of education_____

Expenditures: Health department, \$_____ Board of education, \$_____

Duties of school nurses_____

Medical inspection_____

Examinations for defects_____

Follow-up _____

Absenteeism_____

Other duties_____

Ratio of nursing personnel to number of pupils_____

Comment_____

13. *Special classes*:

For undernourished_____

Are school lunches provided_____

Number served_____ Cost per lunch, \$_____

For mental defectives_____ No. pupils_____

For tubercular pupils_____ No. pupils_____

For physical defects_____ No. pupils_____

For other conditions_____ No. pupils_____

Results_____

Comment_____

14. *Health education in schools*:

Provisions for teaching health, hygiene, or physiology_____

Elementary grades_____

High schools_____

By whom taught_____

Time given: Elementary_____ High_____

Scope of subjects_____

Obligatory_____ Optional_____

Results_____

Promotion of health habits_____

Directed by_____ In what grades_____

Attention given to_____

Results_____

Health instruction to teachers_____

Conducted by_____ In what grades_____

Time given to instructions_____

Courses given_____

Results_____

14. *Health education in schools*—Continued.

"Modern health crusades"-----
Outline program-----
Conducted by----- In what grades-----
Results-----
Comment-----

15. *Social hygiene and sex education:*

Provisions for teaching social hygiene-----
In what grades----- By whom-----
Scope-----
Time given----- Number of pupils-----
Provisions for teaching sex hygiene-----
In what grades----- By whom-----
Scope-----
Time given----- Number of pupils-----
Are social advisors employed----- How many----- By whom-----
Personal conferences-----
Talks given-----
Regular courses-----
In what grades----- Time given----- No. pupils-----
Comment-----

16. *Physical training in schools:*

Provisions made-----
Is systematic physical training given in—
Elementary grades----- High school-----
Supervision of recess periods-----
Extent of-----
Playground facilities—at what schools-----
Is equipment adequate-----
Supervision-----
Gymnasium facilities-----
Extent used-----
Swimming pools-----
Extent used-----
Sanitary supervision-----
Athletics-----
Elementary grades-----
High schools-----
Comment-----

17. *Miscellaneous activities:*

Medical examination of teachers:

Scope----- Frequency-----
Made by----- Purpose-----
Comment-----

Free transportation: Facilities provided

By whom----- No. pupils accommodated-----
Cost data-----
Comment-----

Sanitary supervision of school buildings:

Extent of control by health department-----
Toilet facilities-----
Drinking facilities-----

17. *Miscellaneous activities*—Continued.

Sanitary supervision of school buildings—Continued.

Ventilation_____

Lighting_____

Overcrowding_____

General cleanliness_____

Comment_____

IX. WORKING PAPERS—SUPERVISION OF CHILDREN IN INDUSTRY

1. *Legal provisions:*

Adequacy_____

Enforcement_____

Under jurisdiction of_____ Time_____ Salary, \$_____

Other personnel_____

Expenditures: Salaries, \$_____ Other, \$_____ Total, \$_____

2. *Examinations:*

Is physical examination required_____

Scope_____

Record or data required_____

Made by whom_____ Where_____

Standards for specified work_____

Reexaminations on change of: Occupation_____ Employment_____

Scope_____ Purpose_____

What defects permanently disqualify_____

Number of certificates so refused_____

What defects temporarily disqualify_____

Number of certificates withheld_____

Number subsequently granted_____

Total number of examinations (year_____): Original_____ Reexami-
nations_____

Total number of certificates issued (year_____) _____ Total in force_____

3. *Illegal employment:*

Number of children illegally employed_____

Types of occupation_____

Efforts to prevent_____

4. *Records kept*_____5. *Comment*_____

X. SCHOOL HEALTH SUPERVISION (NONOFFICIAL)

Write-up all nonofficial activities directed toward school health supervision or control of children in industry. Determine their relation to the health or educational authorities:

City of _____

K. CARE AND PROMOTION OF MENTAL HEALTH

1. *Activities of public and private agencies:*

(Brief outline of such efforts as are being undertaken for the prevention of mental diseases and the promotion of mental health by the (1) State authorities; (2) municipal authorities; (3) private or charitable agencies. Include record of (a) legal provisions; (b) personnel; (c) expenditures; (d) brief outline of program, etc.)

2. *Cooperative relations:*

Between State and local authorities _____

Between official and voluntary agencies _____

Comment _____

3. *Attitude toward mental hygiene:*

Of official agencies _____

Of nonofficial agencies _____

Physicians _____

Community _____

Is knowledge of psychiatry required for medical license _____

Comment _____

4. *Vital statistics:*

What mental diseases are reportable _____

By whom _____ Nomenclature used _____

Attitude of health department as to notification _____

As to feasibility of collecting data _____

Value of existing records on mental mortality _____

Do institutions collect data re mental conditions _____

Do courts, charitable, or other agencies collect such data _____

Has endemic index of mental diseases been made _____ When _____

Special studies made _____

Records _____

Comment _____

5. *Legal provisions for care and control of mental cases:*

Provisions for institutional treatment of—

Insane _____

Mentally disordered _____

Does State legally assume exclusive care in institutions of—

Insane _____ Feeble-minded _____ Epileptics _____

If not, outline provisions made _____

Provisions for mental examinations of delinquents _____

Under jurisdiction of what court _____

Juvenile offenders _____

Recidivists (repeaters) _____

Offenders in jails and prisons _____

Provisions for care of mentally disordered delinquents _____

Insane _____

Feeble-minded _____

Epileptics _____

Provisions for deporting nonresident mental cases (public charges) _____

Other provisions _____

5. *Legal provisions for care and control of mental cases*—Continued.
Records kept-----
Comment-----
6. *Facilities for promoting study of mental hygiene:*
In local medical schools-----
Postgraduate study-----
Special neurological societies-----
Training school facilities—
 For psychiatric social workers-----
 For public-health nurses-----
Facilities for training public-school teachers—
 In elementary psychiatry-----
For pedagogic teaching of underaverage children-----
Comment-----
7. *Education of mentally defective children:*
Efforts to detect-----
Training facilities-----
 State aid-----
 Teaching staff-----
 Number of children enrolled--- Number returned to regular classes---
 Number sent to institutions for feeble-minded-----
Efforts at placement in occupations-----
 Under whose supervision-----
Attitude of local authorities-----
Comment-----
8. *Facilities for early treatment:*
Provisions for treatment-----
 By health department-----
 In charge of----- Other personnel-----
 Expenditures: Salaries, \$----- Other, \$----- Total, \$-----
Records kept-----
Comment-----

TABLE XXII.—*Facilities for early treatment*

	Name of institution	Number of beds		Average monthly admittance		Number under care		Character of service
		M.	F.	M.	F.	M.	F.	
Insane-----								
Feeble-minded-----								
Epileptics-----								

9. *Clinics for mental cases* (write-up under Section U) :
Facilities for diagnosis-----
Are mental cases treated in clinics-----
 Under whose supervision-----
Types of cases so treated-----
Provisions for mentally defective children-----
Are these clinics separate or part of general medical clinics-----
Attitude of health department toward clinics-----
Records kept-----
Comment-----

10. *Mental examination of offenders:*

Personnel for mental examinations_____

Psychologists_____ Probation officers_____

Social workers_____ Physicians_____

Expenditures: Salaries, \$_____ Other, \$_____ Total, \$_____

Juvenile delinquents_____

Is separate court maintained_____ Average number of cases per month_____

Are all cases examined_____ What ones_____

Are examinations made before or after trial_____

Adult offenders_____

Are all cases examined_____ What ones_____

Average number of cases per month_____

Detention facilities_____

Disposition of offenders_____

Attitude of court_____

Records_____

Comment_____

11. *Mental examination of dependents:*

Are mental examinations made of those seeking "poor relief"_____

By whom_____ Number of mental cases detected_____

Attitude of department of charities_____

Attitude of charitable agencies_____

Records_____

Comment_____

City of_____

L. INDUSTRIAL HYGIENE

1. *Organization:*

Activities of health department_____

Under supervision of_____ Time_____ Salary, \$_____

Other personnel_____

Expenditures: Salaries, \$_____ Other, \$_____ Total, \$_____

Activities of State authorities_____

Personnel_____ Expenditures, \$_____

Activities of other agencies_____

Comment_____

2. *Industries providing industrial medical service:*

(If feasible, outline activities of industrial concerns providing industrial medical service, including personnel, expenditures, statistical records, etc.)

Clinics and dispensary facilities_____

Nursing services_____

Rest rooms_____

Eating facilities_____

Group insurance_____

Comment_____

3. *Legal provisions concerning industrial occupations, hazards, etc.:*

Scope of laws_____

Is industrial code enforced_____ By whom_____

Has health officer authority to prevent industrial hazards_____

Are employees' compensation laws in force_____

Number and character of cases settled_____

Are hours of labor for women and children regulated_____

Are working papers required_____

Number of prosecutions for violation of industrial code_____ Number
of convictions_____

Nature of violations_____

Comment_____

4. *Notification of industrial diseases:*

What diseases are reported_____

Records kept_____

Comment_____

5. *Investigation of cases:*

Extent of study of occupational diseases_____

Are cases visited_____ Where_____ By whom_____

Total visits (year_____)_____ Total number of cases_____

Data procured_____

Action taken_____

Visits to plants_____ By whom_____ Total number of visits_____

Action taken_____

Records kept_____

Comment_____

6. *Occupational clinics (see also Section U):*

Number_____ Location_____ Operated by_____

What examinations are made_____ Total number of examinations_____

Studies of special groups_____

Other service_____

Comment_____

7. *Nursing service:*

Is industrial nursing service provided_____

By whom_____

Personnel_____

Scope of service_____

Number of visits (year_____)_____ Number of cases_____

Activities of nonofficial agencies_____

Number of nurses_____ Number of visits_____ Number of cases_____

Records kept_____

Comment_____

8. *Sanitary inspection and control:*

Scope of inspections made_____

Frequency_____ Number of inspections_____

Examination of food handlers_____

Action taken_____

Are any special studies made of: Heating_____ Lighting_____

Ventilation_____ Safety devices_____ Fatigue_____

Other activities_____

Records kept_____

Comment_____

9. Educational measures:

Outline-----
Are placards, pay-envelope folders, etc., distributed in factories-----
Other special efforts-----
Comment-----

10. Miscellaneous measures:

Life extension institute-----
 Number of plants served----- Number of employees involved-----
 Number of physical examinations made-----
Safety-first movements-----
Safety engineering activities-----
City of -----

M. PUBLIC-HEALTH NURSING

1. Organization—Health department:

Is there a separate bureau or division-----
Is there central supervision of nurses----- Under whom-----
If not, how organized-----
Is there any duplication of work-----
Are nurses under medical supervision-----
Expenditures: Salaries, \$----- Other, \$----- Total, \$-----
Comment-----

2. Personnel:

How are nurses appointed-----
 Under civil service----- Exceptions-----
Qualifications as to: Training----- Experience-----
Are uniforms worn----- Is overtime or night service provided-----
Facilities for training public-health nurses-----
Comment-----

3. Public-health nursing activities:

TABLE XXIII.—Character of services provided

	Health depart- ment	School board	Private agencies	
A. Generalized plan-----				
B. Specialized plan-----				
1. Preventive work-----				
2. Bedside nursing-----				
3. Combined service-----				

NOTE.—A. *Generalized plan*.—Each nurse renders all public health nursing for a designated district, including usually educational and preventive work, communicable-disease control, tuberculosis, infant welfare, etc., with incidental emergency bedside care.

B. *Specialized plan*.—Individual nurses are assigned to a special service, such as communicable-disease control, tuberculosis, infant welfare, etc., and usually combine educational and preventive work with incidental bedside care. Under this plan several nurses may visit the same house or cover the same district.

1. *Preventive work*.—This includes such activities as teaching hygiene in the home, instructions in measures of isolation, and concurrent disinfection, etc.

2. *Bedside nursing*.—Actual care of the sick as an emergency or hourly service, usually performed by private agencies.

3. *Combined service*.—A combination of preventive work with bedside care.

Do nurses perform the following functions:

Take cultures for diagnosis and release.....
 Make preliminary investigations for contacts.....
 Gather epidemiological data.....
 Vaccinate against smallpox, etc.....
 Assist at clinics.....
 Other special duties.....

4. *Voluntary agencies:*

Secure reports and statistical records of private agencies.....
 Are they cooperating with the health department.....
 Special activities.....

TABLE XXIV.—*Nursing personnel and expenditures, all agencies*

Agency	Number of personnel employed					Expenditures		
	Director	Super- visors	Staff nurses	Total nurses	Clerical (not nurses)	Salaries	Other	Total
Health department.....								
School board.....								
.....								
.....								

TABLE XXV.—*Classification of nursing services, all agencies*

Agency	Number of nurses employed in—						
	Gener- alized public- health nursing service	Commu- nicable diseases	Tuber- culosis	Infant welfare	School hygiene	Other	Total
Health department.....							
School board.....							
.....							
.....							

TABLE XXVI.—*Record of nursing activities, all agencies*

Number of visits	Gener- alized service	Commu- nicable diseases	Tuber- culosis	Infant welfare	School hygiene	Other	Total visits
Health department.....							
School board.....							
.....							
.....							

City of_____

N. PUBLIC-HEALTH LABORATORY

1. *Equipment and personnel:*

Location _____ Space _____

Equipment _____

Adequacy _____

Needs _____

When was it established _____

Personnel:

Director _____ Time _____ Salary, \$ _____

Other duties _____

Qualifications _____

Other personnel _____

Salaries and duties _____

Expenditures: Salaries _____ Other, \$ _____ Total, \$ _____

Fees collected, \$ _____ Total, \$ _____

Comment _____

2. *Scope of work:*

General _____

Are examinations free _____ Exceptions _____

Culture stations _____ Collections _____ By _____

Outfits provided _____

Antitoxins supplied _____

Vaccines supplied _____

Other material _____

Sources of vaccines, etc _____

Vaccines, etc., prepared _____

Records kept _____

Special researches _____

Comment _____

TABLE XXVII.—*Record of examinations*

Disease or material	Kind of examinations made	Total
Water_____	_____	_____
Milk_____	_____	_____
Drugs_____	_____	_____
Pathological_____	_____	_____
Typhoid_____	_____	_____
Tuberculosis_____	_____	_____
Diphtheria_____	_____	_____
Syphilis_____	_____	_____
Gonorrhea_____	_____	_____
Malaria_____	_____	_____
Plague_____	_____	_____
Rabies_____	_____	_____
Urine_____	_____	_____
Feces_____	_____	_____
Grand total_____	_____	_____

TABLE XXVIII.—*Treatments*

Material prepared for administration	Number of doses	Number of persons treated	Given by—	
Smallpox vaccine.....				
Typhoid vaccine.....				
Diphtheria antitoxin (prophylactic).....				
Diphtheria antitoxin (therapeutic).....				
Schick tests.....				
Diphtheria toxin—antitoxin.....				
Salvarsan.....				
Neosalvarsan.....				
Rabies.....				
Grand total.....				

Include here only materials prepared in the laboratory or treatments given by the laboratory staff.

3. *Special notes:*

Activities of State laboratory in city.....
.....
Examinations made.....
Attitude of local physicians.....
 Use of facilities provided.....
Efforts to increase use of facilities.....
Reports issued.....
Comment.....
.....
.....

City of.....

O. CONTROL OF MILK SUPPLIES

1. *Organization:*

How organized.....
Under supervision of..... Time..... Salary, \$.....
 Other personnel.....
Equipment.....
Expenditures: Salaries, \$..... Other, \$..... Total, \$.....
Extent of State control.....
 Effectiveness.....
Legal provisions.....
 Adequacy.....
 Enforcement.....
 Prosecutions: Number..... By whom.....
 Number of convictions.....
 Fines..... Number of licenses revoked.....
Resale of condemned milk: How prevented.....
Records kept.....
Comment.....

2. Sources of supply:

Number of producing dairies_____ Location_____

Number registered_____ Number licensed_____

Number of permits_____ Term_____ Fee, \$_____

Inspections made by_____ Frequency_____ Total (192__)_____

Scoring_____ By whom_____ Frequency_____

Minimum score allowed_____ Average score (192__)_____

Score method used_____ Scores published_____

Are utensils sterilized_____ How_____

Veterinary examinations of herds_____

Action against infected dairies_____

Visits_____ Reinspections_____

Physical examinations at dairies_____ Made by_____

Requirements_____

Effectiveness of control measures_____

Extent State supervision_____

Comment_____

3. Tuberculin tests:

Legal provisions_____

Enforcement_____

Tests made by_____ Frequency_____

Per cent cows tested_____ Per cent reactors_____

Disposition of reactors_____

Comment_____

4. Medical milk commission:

Organization_____

Activities_____

Number of dairies certified_____

Total output_____

Effectiveness of control_____

Comment_____

5. Milk epidemics:

Have milk outbreaks been detected_____

Record of milk epidemics_____

6. Pasteurization:

Legal provisions_____

Enforcement_____

Is re-Pasteurization permitted_____

Under supervision of_____

Number of plants_____ Location_____

Total gallons output daily_____ Per cent total supply_____

Methods in use_____

Temperature_____ Time of holding_____

Are automatic recording thermometers used_____

Frequency of inspections_____

Effectiveness of control_____

Records kept_____

Cost data_____

Comment_____

7. Distribution:

Extent of supervision_____

In charge of_____

7. *Distribution*—Continued.

Number of permits_____ Licenses_____ Term_____ Fee, \$_____
 Total number of distributors: Farms_____ Depots_____
 Stores_____ Wagons_____
 Pasteurizing plants_____ Ice-cream factories_____ Grand total_____
 Inspections made _____
 Frequency_____ By whom_____
 Method of sterilization of apparatus_____
 Scoring_____ By whom_____
 Frequency_____ Average score_____
 Minimum score allowed_____ Are scores published_____
 Scoring method used_____
 Grades sold: Certified_____ Pasteurized_____ Other grades_____
 How are grades determined_____
 Average age of milk delivered_____
 Consumption: Total daily average_____
 Certified_____ or _____%. Pasteurized _____ or _____%
 Other grades _____
 Cream_____ Buttermilk_____ Skimmed milk_____
 Ice cream_____
 Per cent delivered in bottles_____
 How served at eating places and stores_____
 Is sale of reconstructed milk permitted_____ Amount sold_____
 Temperature requirements: At farms_____ In transit_____
 At depots_____ On delivery_____
 Is physical examination of milk handlers required_____
 Examinations made by_____
 Requirements_____
 Action taken_____
 Deliveries to infected premises_____
 How controlled_____
 Effectiveness of control_____
 Records kept_____
 Comment_____

8. *Private supplies*:

Extent of supervision_____
 In charge of_____
 Number registered_____ Number of permits_____
 Term_____ Fee, \$_____
 Number of private cows in city_____
 Estimate of number of persons supplied_____
 Inspections made_____ By whom_____
 Records kept_____
 Effectiveness of control_____
 Comment_____

9. *Laboratory control*:

Provisions made_____
 Examinations made by_____ Samples taken by_____
 Frequency of sampling: Farms_____ Depots_____ Delivery_____
 Average number of examinations per year: Farms_____
 Depots_____ Delivery_____

9. *Laboratory control*—Continued.

Chemical standards required_____

Total solids_____ Solids not fat_____ Fat_____ Water_____

Enforcement _____

TABLE XXIX.—*Bacteriological standards for milk*

	Certified	Pasteur- ized	Grade	Grade	Grade	Cream
Pasteurized:						
Maximum_____						
Minimum_____						
Raw:						
Maximum_____						
Minimum_____						

TABLE XXX.—*Record of milk examinations*

	Certified	Pasteur- ized	Grade	Grade	Grade	Cream
Total examinations_____						
Average count_____						
Maximum count_____						
Minimum count_____						
Per cent over 500,000_____						
Per cent standard_____						

Method used for bacterial counts: Plate method_____

Direct microscopic count_____ Other_____

Are results of examinations published_____

Action taken if below standard_____

Number of prosecutions_____

Estimate of quality_____

Records kept_____

Comment_____

City of_____

P. CONTROL OF OTHER FOODSTUFFS

1. *Organization:*

In charge of_____ Time_____ Salary, \$_____

Other personnel_____

Qualifications required_____

Equipment _____

Expenditures: Salaries, \$_____ Other, \$_____ Total, \$_____

Extent of State control_____

Effectiveness_____

Legal provisions_____

Adequacy_____

Enforcement_____

Prosecutions: Number_____ Nature of violations_____

Number of convictions_____ By whom_____

1. *Organization*—Continued.

Legal provisions—Continued.

Number of licenses or permits revoked_____ Amount of fines_____

Quantities condemned_____

Disposition of condemned products_____

Comment_____

2. *Scope of activities:*

General _____

Inspections made_____

Effectiveness_____

Kinds of licenses issued_____

Fees, \$_____ Terms_____

By whom_____ Form used_____

Permits issued_____

By whom_____

Places scored_____

By whom_____ Frequency_____ Form used_____

Physical examination of food handlers_____

Scope of examination_____ Made by_____

Frequency_____ Total number of examinations_____

Action re infected persons_____

Sterlization of utensils_____

Eating places_____ Soda fountains_____

Protection of displayed food_____

Sidewalk displays_____

Special activities_____

Cooperation with other food-control agencies_____

Publicity given_____

Records kept_____

Comment_____

TABLE XXXI.—*Record of inspections*

	Total number	Number scored	Average score	Number of inspections	Frequency
Hotels_____					
Eating places_____					
Soda fountains_____					
Fruit stands_____					
Bakeries_____					
Groceries_____					
Meat markets_____					
Slaughterhouses_____					
Total_____					

3. *Meat inspection:*

Extent of municipal inspection_____

Extent of State inspection_____

Extent of Federal inspection_____

Number of slaughtering houses_____ Location_____

Number slaughtered annually: Cattle_____ Swine_____

Calves_____ Sheep_____

Number of carcasses condemned_____

Causes for condemnation_____

3. *Meat inspection*—Continued.

Quantity of meat and meat products inspection (year_____)

Quantity condemned_____

Causes of condemnation_____

Disposition of condemned material_____

Effectiveness of inspection service_____

Records kept_____

Comment_____

City of_____

Q. CONTROL OF DRUGS

1. *Organization:*

Under supervision of_____ Time_____ Salary, \$_____

Other personnel_____

Equipment _____

Expenditures: Salaries, \$_____ Other, \$_____ Total, \$_____

Extent of State control_____

Effectiveness _____

Federal control activities_____

Effectiveness _____

Legal provisions_____

Adequacy _____

Enforcement _____

Comment_____

2. *Scope of activities:*

What is being done_____

What classes of drugs are given special attention_____

What licenses are issued_____

Permits _____

Fees charged, \$_____ Term_____

What inspections are made_____

By whom_____ Frequency_____

Total number of inspections (year_____)

What samples are taken_____ By whom_____

Frequency_____ Total number of samples (year_____)

Analyses made_____ By whom_____

Total number of examinations_____

What is basis for collection of samples_____

Prosecutions: Number_____ Number of convictions_____

Licenses revoked_____ Fines, \$_____

Quantities condemned_____

Disposition_____

Records kept_____

Results_____

Comment_____

City of _____

R. CONTROL OF WATER SUPPLIES

1. PUBLIC SUPPLY

1. *Historical data:*

Owned by _____ Operated by _____
Present supply installed _____
Previous supplies _____
Date of beginning purification _____ Disinfection _____
Adequacy of present supply _____
Accidents to supply _____
Comment _____

2. *Control of operation:*

Operation under supervision of _____
Extent control by health department _____
Comment _____

3. *Source of supply:*

Derived from _____
• If wells: Number _____ Type _____ Average depth _____
Total capacity _____ Location _____
Drainage area _____ Square miles with population of _____
Extent control over watershed _____
Storage reservoirs _____
Under supervision of _____
Pollution hazards _____
Storage capacity _____ Mg. _____ days. Average period _____
Shortages experienced _____
Emergency supplies _____
Sanitary quality _____
Use of _____
Cross connections with other supplies _____
Use of _____
Comment _____

4. *Treatment:*

Methods in use _____
In charge of _____
Physical equipment _____
Rated capacity _____ mgd. Operated capacity _____ mgd.
Coagulation _____ Detention _____
Filters: Type _____ Capacity _____
Storage: For treated effluent _____
Number of reservoirs _____ Capacity _____ mg.
Disinfection _____
Method _____
Control _____
Operating cost per mg. _____
Efficiency of treatment _____
Comment _____

5. Laboratory control:

Under supervision of _____
Equipment _____ Location _____
Personnel _____
Expenditures: Salaries, \$ _____ Other, \$ _____ Total, \$ _____
Samples taken _____ By whom _____
Frequency _____ Total number (year _____)
Examinations: Bacterial—for _____ Total number (year _____)
Chemical—for _____ Total number (year _____)
Other examinations _____
Are standard methods of water analysis used? _____
Records kept _____
By health department _____
Effectiveness of control _____
Comment _____

6. Quality:

Raw water _____
Treated water _____
Bacteriological quality _____
Per cent samples meeting Treasury Department standards for purity _____

TABLE XXXII.—Samples of water showing B. coli

Period or year _____	10 c. c.	1 c. c.	0.1 c. c.
Per cent showing B. coli: Raw _____			
Per cent showing B. coli: Treated _____			

Comment _____

7. Distribution:

Pumping equipment: Condition _____
Adequacy _____
Reserve _____
Capacity: Maximum _____ Average _____
Low pressure _____ High pressure _____
Is supply adequate for fire protection _____
Distributing reservoirs: Number _____
Capacity _____ mg. Period storage _____
Consumption: Ave. daily _____ mgd. Per capita consumption _____ (gpd.)
Number of services _____ Number metered _____
Per cent total population using _____ Per cent accessible _____
Total population using public supply _____
Cost per mg. distributed, \$ _____ Cost to consumer, \$ _____
Comment _____

II. PRIVATE SUPPLIES

1. Extent supervision:

By health department _____
By other departments _____
Legal provisions _____
Enforcement _____
Attempts to abolish _____

1. *Extent supervision*—Continued.

Inspections made_____ By whom_____

Samples taken_____ By whom_____

Results of examinations_____

. Comment_____

2. *Private wells*:

Number in use_____ Types_____

Number of persons using_____ Per cent of total population_____

Quality_____

Distribution_____

Comment_____

3. *Other private supplies*:

4. *Industrial supplies*:

Use by industries_____

Use by hotels, etc._____

Location_____

Safeguards_____

Extent supervision_____ By whom_____

Extent used for drinking purposes_____

Total persons affected_____

Quality_____

Comment_____

5. *Bottled water*:

Extent used_____

Sources_____

Supervision_____

Quality_____

Comment_____

City of_____

S. EXCRETA DISPOSAL

I. PUBLIC SEWERAGE SYSTEM

1. *Historical data*:

System installed_____ Operated by_____

Separate or combined systems_____

Growth and extensions_____

Comment_____

2. *Supervision*:

Legal provisions_____

Enforcement_____

By health department_____

Inspections_____ By_____

Frequency_____ Total number_____

Comment_____

3. *Equipment and service:*

Per cent total population accessible_____ Per cent connected_____

Number of connections recorded_____ Number of persons connected_____

Character of plumbing in use_____

Adequacy _____

Number of outside flush closets connected to system_____

Inspections_____ By_____

Frequency _____ Total number_____

Extent fecal exposure_____

Conditions_____

Records kept_____

Comment _____

4. *Sewage treatment:*

Method_____ Date installed_____

Equipment_____

Technical supervision_____

Laboratory_____

Operation_____

Condition of plant_____

Capacity: Rated_____mgd. Operated capacity_____mgd.

Average daily volume treated_____

Efficiency of treatment_____

Character of effluent_____

Comment_____

5. *Disposal:*

Effluent discharged to_____

Number of outlets_____ Location_____

Local nuisances_____

Comment_____

6. *Cost data:*

Expenditures: * Salaries, \$_____ Other, \$_____ Total, \$_____

Cost of treatment per mg., \$_____ Treatment and disposal per mg., \$_____

7. *Comfort stations:*

Number of stations_____ Location_____

Hot water_____ Cold water_____ Soap_____ Towels_____ Fees, \$_____

Attendants _____

Extent supervision_____

By health department_____

Comment_____

II. PRIVATE METHODS OF EXCRETA DISPOSAL

1. *Private sewerage systems:*

Number in use_____ Owned by_____

Total persons connected_____ Per cent total population_____

Institutions _____

Industries _____

Treatment_____

Disposal_____

Extent of supervision_____

By health department_____

Comment_____

* Give "Expenditures" chargeable to health department.

2. Privies, cesspools, etc.:

Number in use: Privies—surface or can_____ Vaults_____ Cesspools_____

Number of persons using—surface or can_____ Vaults_____ Cesspools_____

Per cent of total population using—surface or can_____ Vaults_____

Cesspools_____

Other types_____

Distribution_____

Legal provisions_____

Enforcement_____

Efforts to abolish_____

Extent of supervision_____

By health department_____

Number of inspections_____ Frequency_____ Total_____

Extent fecal exposure_____

Extent soil pollution_____

Records kept _____

Comment_____

3. Disposal of night soil:

Legal provisions_____

Enforcement_____

Facilities for collection_____

Number of scavengers_____ Licensed_____

By_____ Fee, \$_____ Term_____

Frequency of collection_____

Methods of disposal_____

Nuisances _____

Extent of supervision_____

By health department_____

Records kept _____

Comment_____

City of_____

T. GENERAL SANITATION**1. Legal provisions:**

Scope _____

Extent enforcement_____

State department activities_____

Comment_____

2. Health department activities:

How organized_____

Under supervision of_____ Time_____ Salary, \$_____

Other personnel_____

Expenditures: Salaries, \$_____ Other, \$_____ Total, \$_____

Scope of activities_____

Equipment _____

Sanitary engineering activities_____

Sanitary police_____

Activities _____

Records kept _____

Comment_____

3. *Nuisances—General inspections:*

In charge of_____ Time_____ Salary, \$_____

Other personnel_____

How is transportation provided_____

What "nuisances" are controlled by health department_____

What is method of abatement_____

Number of "complaints" received_____ Number of "nuisances" abated_____

Number of inspections made on complaint_____

Total number of inspections made_____

Are house-to-house inspections made_____ Frequency_____

Are reinspections made_____ Total number of inspections_____

What importance is attached to "nuisance" abatement_____

Special activities_____

Records kept_____

Comment_____

4. *Plumbing inspections:*

Conducted by what department_____

Extent of control by health department_____

Legal provisions_____

Extent of enforcement_____

(If carried on by health department, secure the following information) :

In charge of_____ Time_____ Salary, \$_____

Other personnel_____

Expenditures: Salaries, \$_____ Other, \$_____ Total, \$_____

Scope of work_____

Number of inspections: New work_____ Old work_____

Repairs _____ Total_____

Comment_____

5. *Housing inspection:*

Conducted by what department_____

Legal provisions_____

Extent of enforcement_____

Is there a housing code_____ Is it adequate_____ Is it enforced_____

Housing conditions—

No. 1 family houses_____ Two-family_____

Tenements_____ Lodging houses_____

Conditions in colored districts_____

Conditions in foreign districts_____

Extent of "overcrowding"_____

Is there a "model housing development"_____

(If carried on by health department secure the following information:)

In charge of_____ Time_____ Salary, \$_____

Other personnel_____

Expenditures: Salaries, \$_____ Other, \$_____ Total, \$_____

Scope of work_____

Are permits issued for: Lodging houses_____

Tenements_____ Other_____

Number of inspections: New_____ Old_____ Total_____

What action is taken_____

Records kept_____

Comment_____

6. *Disposal of garbage and refuse:*

Conducted by what department_____

Extent of control by health department_____

Legal provisions_____

Extent enforcement_____

Collection—

How is garbage collected_____

Frequency from residences_____ From eating places_____

Average daily tonnage: Garbage_____ Other refuse_____ Total_____

Number of private scavengers licensed_____ Per cent refuse collected_____

Is collection adequate and satisfactory_____

Disposal—

Outline methods of disposal_____

Condition of public dumps_____

Are nuisances created_____

Is disposal satisfactory_____

Supervision—

By health department_____

Number of complaints received_____ Number of inspections made_____

Action taken_____

Cost data—

For collection: Gross, \$_____ Net, \$_____ Per ton, \$_____

For disposal: Gross, \$_____ Net, \$_____ Per ton, \$_____

Total _____

Comment _____

7. *Disposal of dead animals:*

Conducted by what department_____

Extent of control by health department_____

Method of disposal_____

Comment_____

8. *Disposal of stable manure:*

Conducted by what department_____

Extent of control by health department_____

Legal provisions_____

Extent of enforcement_____

Number of inspections made_____ Are nuisances abated_____

Special measures against flies_____

Is disposal satisfactory _____

Comment _____

9. *Street cleaning:*

Conducted by what department_____

Extent of control by health department_____

Methods used _____

Cost data: Total expenditures for street cleaning (year ____)_____

General cleanliness of streets and alleys _____

Comment _____

10. *Special activities:*

“Clean-up” campaigns_____

Attempts to control “smoke” nuisance_____

11. *Tourists' camps:*

Number of camps in or near the city_____

Sanitary provisions_____

Extent of control by health department_____

12. *Swimming pools and bathing places:*

Number and location of bathing places_____

Extent of supervision by health department_____

Is water treated_____ How_____

Is water examined_____ Frequency_____

By whom_____ Conditions found_____

Is supervision adequate_____

Comment_____

13. *Antimosquito measures:*

Extent of mosquito prevalence_____

Species_____

Is mosquito control of sanitary importance_____

Extent and character of breeding places_____

Estimated cost of effective control measures_____

Other measures undertaken_____

Legal provisions_____

As to breeding_____

Extent of enforcement_____

Work under supervision of_____ Time_____ Salary, \$_____

Qualifications_____

Expenditures (year____) : Salaries, \$_____ Other, \$_____ Total, \$_____

Screening_____

Effectiveness_____

Prevention of breeding_____

Scope of work_____

Area covered_____ Gallons of oil used_____

Cost data_____

Effectiveness_____

Drainage operations_____

Total area drained_____ Cost, \$_____

Other operations_____

Work remaining_____

Cost of control measures per capita : First year, \$_____ Maintenance, \$_____

Effect on mosquito incidence_____

Comment_____

14. *Rodent extermination:*

Extent of rodent problem_____

Outline work undertaken_____

Under supervision of_____ Time_____ Salary, \$_____

Qualifications_____

Expenditures (year____) : Salaries, \$_____ Other, \$_____ Total, \$_____

Legal provisions_____

Enforcement_____

Rat-proofing operations—

Is building code satisfactory_____

Area involved_____

Number of buildings rat proofed : By city_____ By owners_____

Cost data_____

Work remaining_____

		Indicate kind of service provided, such as "tuberculosis," "infant welfare," "venereal diseases," "general medical," etc.
.....	Advisory consultations	
.....	Clinical diagnosis	
.....	Laboratory diagnosis	
.....	Treatment	
.....	Nursing service	
.....	At station	
.....	At homes	
.....	Home medical service	
.....	Home social service	
.....	Total number of patients cared for during year	
.....	Total number of visits to station during year	
.....	Total number of visits to homes by clinic staff	
.....	Total fees collected	

4. *Outline special activities:*

City of-----

V. MISCELLANEOUS

1. General trend of public-health movement-----

2. Impressions formed during survey concerning present practice and future requirements or needs-----

3. Secure a statement from the health officer expressing his views of future needs of the health department as to appropriations, personnel, etc., and further development. Determine in what way a "bureau of information" established by the Public Health Service can be of assistance to the health officers (in his own words, if possible)-----

4. Outline activities not covered by schedule-----



